ARCHIVES OF OTOLOGY.

ON THE INADEQUACY OF SOME OF THE ARGUMENTS IN FAVOR OF HELMHOLTZ'S THEORY OF THE TRANSMISSION OF SOUND IN THE MIDDLE EAR.

By Dr. GUSTAV ZIMMERMANN, Dresden.

Translated by Dr. J. A. Spalding, Portland, Me.

LAST year I published two papers,[1] with the aim of showing that in all probability that portion of Helmholtz's theory which refers to the transmission of sound to the middle ear was erroneous. I asserted, for instance, that "all vibrations of sound passed indiscriminately through the *Mt* to the air of the middle ear and the bone of the cochlear capsule, and from here betook themselves directly to the labyrinthine capsule without needing any conduction through the chain of ossicles. For, with ordinary vibrations of sound, the *Mt* is not, as Helmholtz assumed, moved in and out *in toto*, nor is the chain of ossicles or the labyrinthine fluid (even in the slightest degree) displaced *as a whole*. If, moreover, with a small minority of vibrations, any such motions are accomplished, they do not serve the physiological purpose of carrying the sound to the ear and causing it to be perceived, but, on the contrary, to weaken it and to regulate it to the finest shades of perception."

Since finishing these earlier papers I have worked out two others, one from a physiological point of view,[2] and one from an otological,[3] made them thus accessible to a still nar-

[1] "Zur Physiologie d. Gehoerorgans." *Münch. med. Wochensch.*, 1899, Nos. 19 and 22.

[2] "Die Uebertragung d. Schallschwingungen," etc. *Arch. f. Physiologie*, 1899, Supp.

[3] "Der Werth unserer Stimmgabelpruefungen auf Grund einer Nachpruefung d. Helmholtz'schen Theorie." *Verhandl. d. Otolog. deutschen Ges.*, Jena, 1899.

rower circle of special students, and additionally prepared myself for objections likely to be raised.

Leaving aside a paper by Matte,[1] because, instead of bringing any proof, he simply thrusts my theory aside as of no account, I shall here confine my replies to the arguments of competent writers who still maintain the truth of Helmholtz's theory of the transmission of sound.

On asking a former teacher of mine, an *eminent physiologist*, his opinion of Helmholtz's theory of sound, he replied: "If you close both windows you produce deafness, and that proves that molecular vibration through the bones is not the path along which sound normally passes. The drumhead with the ossicles is the true road." Now, this train of thought and argument has influenced more or less the thoughts of all investigators ever since the actual purposes of the middle-ear apparatus have been studied; but, attractive as it appears, it has actually but little weight, as can, for instance, be shown by a simple example.

Every steam boiler has as integral parts two orifices, one to let off the steam and one by which to regulate the pressure. Both orifices are indispensable, and if completely or even partially closed instantaneously destroy the mechanism of the boiler. Now it would never occur to anyone to consider these orifices as the path along which the boiler must be heated. The heating is done through the walls of the boiler. It is precisely so for the conduction of sound into the inner ear. Just like heat, so sound penetrates all solid media, and also through bone without the need of any accessory apparatus. Here, too, the window orifices are not the path along which sound must indispensably attain the inner ear; they are only indispensable integral portions of the ear by means of which the sound that enters through the bony walls into the inner ear may there develop its specific action and energy.

If we imagine the labyrinthine windows completely walled in and the labyrinthine fluid everywhere surrounded by a rigid bony capsule, there is not the slightest reason why, despite this condition, sound should enter the bone and pene-

[1] *Arch. f. Ohrenheilk.*

trate within its contents. Just as the ticking of a watch extends along a solid log of wood, so does it penetrate also into and through a capsule filled with fluid. If, however, it is to produce within this capsule not merely molecular movements as in simple propagation of sound, but regularly arranged vibrations like those of a sympathetically vibrating fibre, then this rigid capsule must yield at some one spot, so that the vibrating fibres shall not only have a chance for play but shall accurately obtain the direction in which they shall begin their excursions—that is to say, in the direction of the least resistance. This one spot is *the round window*, the membrane of which is perfectly fitted and alone is sufficient by its alteration in form to yield to the most minute variations of vibration which can possibly be produced by the resonance of fibres suspended in the labyrinthine fluid.

The oval window, on the contrary, together with the middle-ear apparatus, forms the equally indispensable regulator for arranging the intra labyrinthine pressure to the degree best suited for the perception at any given time. The disturbances caused by closure of both windows are, I now maintain, easiest and best explained from this point of view, and, more than that, we are not compelled to assume that the windows are the only path along which sound can possibly reach the inner ear.

Let me next venture to suggest from *an anatomical point of view*, that the window orifices cannot be the path along which sound is conducted, because neither of them, and especially one, can possibly be touched by the chief mass of sound which enters the ear.

The only entrance for sound into the ear that can be called the normal one is the external auditory meatus. All other paths for the reception and extension of sound are obstructed by the strong exterior envelopes of the soft parts, and by the interposition of innumerable obstacles, such as heterogeneous and interrupted cartilaginous structures. If, now, in a marcerated temporal bone we cast a glance at the inner wall of the middle ear along the axis of the bony meatus, the only part of the labyrinthine capsule that comes

into view is that which corresponds to the promontory and the cochlea lying behind it. The two window niches lie upward and backward, and can only be seen when we look diagonally from below and in front, upward and behind. It goes without further argument, so far as *the round window* is concerned, that only a few wandering waves of sound can reach its membrane, and these only by a circuitous path. For the membrane lies like an asymmetrical cupola in the upper portion of a niche arising tunnel-like from below. Hence, waves of sound must either penetrate the outer bony wall of the niche, so as to reach the membrane slantingly, or, extending along in the middle ear, they must by various reflections be brought from below against its surface. Both ways are devious, and there is no reason why sound should take them at all, when propagation along the bone, directly to Corti's organs, is so much nearer at hand.

Furthermore, the position of the *oval window* outside of the circle of projection argues against transmission along this path in all those cases in which, the *Mt* being absent and the chain of ossicles interrupted, we still insist on the propagation of sound directly through the plate of the stapes. In this case also, only a minimal portion of the waves can be utilized, and it would still remain forever unexplained why the greater mass of waves of sound should be entirely inactive and unutilized.

In other cases, the normal ones, in which conduction does not take place directly through the stapes, but, as hitherto assumed, through movements communicated to the stapes-plate through the *Mt* and ossicles, it would be of still less consequence whether the oval window lay directly opposite or obliquely to incident rays of sound. And at this point other considerations begin to have weight.

Many are the ways in which the ossicles have been assumed to transmit waves of sound communicated to them from the *Mt.* The oldest theory (Johann. Mueller's) is molecular transmission, precisely as along a rigid staff. This has been abandoned, because the ossicles do not represent such a staff, but, with interposed articulations and intra-articular cartilaginous discs and innumerable points of contact

with the wall of the middle ear by numerous bony projections and ligaments, they obstruct an exact and insulated transmission of sound to the oval window.

Mueller based his theory on the correctly recognized truth that only the most violent action of sound can move the *Mt in toto.* This truth Helmholtz neglected when he asserted that all waves of sound, indiscriminately, moved the *Mt in toto* and with it the chain of bones, and in that way nearly at the same instant displaced the labyrinthine fluid as a whole from the oval window to the round. He based his argument, as I have before insisted, on experiments with *forcible vibrations of sound*, and then transferred the results universally to all vibrations, no matter how delicate. But we can prove that in the vast majority of vibrations which are simply perceived as such, it is impossible for the *Mt* to be dislocated inward and outward *as a whole.*

At this point I come to a counter-argument advanced in favor of the Helmholtz theory from a *physiological point of view.* One of our most able physiologists cites the great length of waves of sound to show that all of the molecules of the *Mt* must simultaneously perform the same movement, and hence that the *Mt* must oscillate *in toto.*

"Inasmuch," he says, "as the rapidity of the extension of sound in the air amounts to 340 *m* a second, it must be greater still in the *Mt* itself. In bone it has been estimated at 2000 *m* a second. If we assume only 1000 *m*, we have a wave-length of 2 *m* for a tone of 600 vibrations in a second, and for a tone of 20,000 vibrations, lying well up to the highest range of perceptivity, a wave-length of 5 *cm.* This, however, would require that collectively all of the molecules of the *Mt* lying in the direction of the sound and not more than $\frac{1}{10}$ *mm* apart should be in the same phase of vibration whilst a wave of sound passes through the *Mt.* But if all of the molecules of the *Mt* simultaneously perform the same movement it means that the membrane vibrates *in toto* no matter how minute the vibrations may be."

These deductions deserve great consideration for the very reason that they have often been compulsorily employed to support the prevalent opinions upon this topic. They do,

of course, prove that during the passage of a wave of sound through the *Mt* all of its molecules are simultaneously set in motion. But in arriving at such a conclusion we must be aware that no account is made of the interval which lies between the wave contact on the external and internal layers of the membrane, and by which additionally the molecules of the outer side again fall into a state of rest. As this interval amounts to hardly a ten-millionth of a second, it may be very properly left out of consideration in comparison with the larger space, *e. g.*, $\frac{1}{500}$th of a second occupied in transit by a wave of 500 vibrations.

Taking these things for granted, we may possibly assert that the molecules of the *Mt* are all simultaneously in motion to one wave of sound, but we cannot prove from the previous deductions that they all also participate in the same motion. In order to decide this, we must not so much investigate the amplitude of the waves as the extent of excursion which every molecule makes, and these are two very different things. For, whilst the wave advances through considerable distances, each separate atom through which it passes moves but slightly to and fro, and a wave of longer length does not produce correspondingly broader excursions of the vibrating molecules. Whilst the separate waves of a tone of 500 vibrations, *e. g.*, move 2 *m* in $\frac{1}{500}$th of a second, each individual molecule needs to pass over but an infinitesimal space in the same time, the extent of that space depending plainly and solely on whether the molecules of the *Mt* mutually vibrate in similar phases or not. A molecule on the outer side would have to move 0.1 *mm* from its position of rest if at the same time the opposite molecule on the inner side of the *Mt* is to be simultaneously touched by the sound and included in the same phase of vibration. If the width of the vibratory wave is less, say 0.01 *mm*, the molecule passes only through $\frac{1}{10}$th of the thickness of the *Mt*, and then begins to oscillate back. The adjacent molecules in turn take up the movement, transmit it to the second tenth of the *Mt*, after they have exhausted their amplitudes, and so the play repeats itself in the following segments until at last at the end of this series the molecule on the inner side is struck and

driven inward. During these incredibly rapid processes the molecules of the various portions of the *Mt* must necessarily belong to entirely different phases of movement and must remain so, so long as the wave of sound is passing through. Therefore, we can only claim that the *Mt* oscillates or vibrates *in toto* when the molecular amplitude is as great or greater than the thickness of the *Mt* itself, and when all of its molecules perform the same movement.

In order to verify the theory that the *Mt* vibrates *in toto* to all waves of sound and in that way conveys sound to the middle ear, we must prove that all waves of sound perceived by the ear have an amplitude of at least 0.1 *mm.* No such proof can be brought, and, on the contrary, we know of waves of sound that are actually audible, yet that do not have an amplitude of even a millionth of a single millimetre.

The extent of the molecular amplitude, as I have repeatedly insisted, is not determined by the various lengths of the waves. It may vary with tones of same pitch, it may be identical with low as with high tones, and is determined by the height of the waves, *i. e.*, by the intensity of the sound, which may be slight, or by the cessation of the production of sound, or, decreasing with the square of the distance from the source of sound, it may diminish to zero. Exact experiments with organ pipes have shown amplitudes for perceptible tones from 0.00004 to 0.0000001 *mm.* Hence, if we consider how these infinitesimal values may be diminished by reflexions and refractions in the curvature of the meatus and further reduced by obstructions in the substance of the *Mt* itself, we prove that such tones must have passed through the *Mt* without having set it into vibration scarcely at all, to say nothing of vibrating it *in toto.* Nor does it seem credible that the tones could have been transmitted by movements of the ossicles, because they have not received the slightest impulse from the *Mt.* Molecular transmission by the ossicles as a chain seems impossible from its very construction, and I feel that there is no other escape than to urge my theory: that the tones have communicated directly with the cochlear capsule through the air of the middle ear.

If this is possible for the most delicate vibrations at the upper limit of perception, how much more probable, with more intense vibrations of sound, to assume that they too may extend along the same path and that they actually do not need any sort of conducting mechanism or accessory apparatus. Furthermore, we may go so far as to demand for such intense vibrations some protecting and regulating apparatus to deaden those that are too powerful and to diminish slightly the force of those that are a trifle less intense. Now the middle-ear apparatus, from the *Mt* to the plate of the stapes, all included, seems admirably adapted for some such purpose as this. The more we think of it the more incredible it seems that so highly organized a sense as that of hearing should dispense with such protections to stretch its fibres or to dampen them exactly and accurately as is the case with every musical stringed instrument.

A skilled otologist argues against my theory, calling to his aid the mechanism of the phonograph. He lays emphasis on the tin-foil impressions made by the phonographic pencil upon the cylinder, and urges by analogy that in the same way in the ear the chain of bones transmits sound and makes it audible. Here lies apparently an important objection to my theory, and one indeed which I personally perceived, and which for a long time held my judgment in abeyance. The mechanism in both cases is the same so far as that the sound passes through a delicate elastic plate connected with a lever mechanism. Hence, of course, a similar sort of mechanism suggests a similar method of accomplishing the function. More careful examination, however, shows important differences both in the action and in the construction of the two. For, first, the phonograph is far from reacting to all those finer shades of sound to which the ear actually reacts by perceiving the sound. Gentle whispers, the song of distant birds, fail to move the phonograph in the least degree, yet such sounds our ears perceive. And if we compare the two in construction we find that those tones which could not possibly have set the phonograph in motion, and yet were heard by the ear, could not have excited the function of the middle-ear apparatus, and must without

its assistance have communicated themselves to the inner ear, because the middle-ear apparatus is far less sensitively constructed than the phonograph. The articulation of the phonographic plate with the lever is not accomplished by a firmly inwoven mechanism, as is the case of the handle of the hammer with the *Mt*, but by means of an elastic spring which gives a much more free and delicate play to the leverage. Another point in favor of the phonograph is the constructive difference in the arrangement and apparatus in which in both cases the sound is received. The large sound-funnel of the phonograph aims to collect the greatest possible volume of sound so as to increase the number of waves and the intensity and rarefaction of the particles of air, and to magnify in every way the intensity of the sound, whilst the contracted, tortuous meatus, of varying width at various portions of its course, lets in fewer waves of sound than the phonograph, to begin with, and then reduces their intensity by reflexes and changes in curvature. In this way, evidently, the smaller number of effective tones, which in contradistinction with those in the phonograph finally come to account in the middle-ear apparatus, is still more diminished and even literally reduced to those that were originally the most intense of all. If, however, such waves finally move the angular lever of the ossicular system, the method is the same as in the phonograph: With the greatest truth and precision each time, as upon the cylinder of the phonograph, an impression is produced upon the labyrinthine fluid. Only, let us urge, we cannot make use of this pressure to support the hypothesis that thereby the vibration of similarly tuned fibres is established, for I maintain, on the contrary, that this pressure obstructs such vibrations.

That this is not a mere supposition of mine can be proved by an experiment long ago made by Gellé, but ever since utilized for an entirely different purpose. If we press firmly the nozzle of a rubber bag into the meatus and place the stem of a vibrating tuning-fork upon the body of the bag itself, the tone of the fork is heard distinctly and powerfully, but if we compress the bag, then with every act of pressure

we hear the tuning-fork less distinctly, and again with every relaxation of the pressure we hear the tone louder again. The compression of the air has pushed in the *Mt* and the chain of bones, whereupon the plate of the stapes thus driven in against the labyrinthine fluid has increased the hydrostatic pressure, which has in its turn acted like a damper on the vibrations of the labyrinthine fibres.

I come next to the objections expressed by an *eminent clinician.* To my assertion that sound is not transmitted through the chain of bones and that the *Mt* tends to diminish sound, he correctly replied that "if this were true we should expect that every patient who had submitted to the radical operation would hear many things much better than people with normal hearing."

This is indeed a correct conclusion to draw from the circumstances, but in this instance we must define the term "hear better" more accurately. A patient who has had the radical operation performed will actually hear individual and connected sounds louder than before, because their intensity is no longer diminished by the interposition of the *Mt.* But it is impossible for him to hear more distinctly or more exactly, because his accommodation for perceiving different sounds is more or less lacking in perfection. He can no longer, amidst the tumult of sounds (which is of course louder than in a person of good hearing), differentiate the tones. It is precisely as when the eye after a cataract-extraction sees everything with the greatest brilliancy but cannot distinctly distinguish the contours of objects because its accommodation is lost by the removal of the lens.

Let me next reply to an objection raised by Bezold. I had asserted that in Rinne's test bone and aërial conduction were compared under two entirely different conditions. In testing bone-conduction we use the stem of the tuning-fork, and in testing aërial conduction, the prongs. Hence we must reach false conclusions, because the stem and the prongs are not of equal value, since the prongs still give off audible vibrations at a time when vibrations from the stem have long since ceased to be heard. Bezold replied that "there was no real difference in the duration of vibrations,

because the stem and the prongs vibrated for exactly the same length of time."

Now it is in the application of this last remark to our present tests for hearing that lies the fundamental and serious error which has up to this time been received as truth, but against which I now protest. When we test the hearing, the question is not whether the stem and the prongs of the tuning-fork vibrate for an equal length of time, but whether they vibrate in the same way and with the same audibility. That they do vibrate in the same way and with the same audibility I deny most emphatically. Similar duration of vibration is far from being the same thing as similar duration of AUDIBLE vibration. Bezold himself has said that the movements of the stem of the fork are as in a two-armed lever, smaller but performed with correspondingly greater intensity. Granting that this is true, then, evidently, the intensity of vibrations, at first greater in the stem, would be rapidly exhausted (in heat inversely) first by the contact of the hand holding the stem, and then by the stem acting as a unilateral damper upon the vibrating middle-part of the fork itself. So that thus we should have various mechanical influences at work unfavorably to the stem and revealing themselves in different durations of audibility.

This we can unmistakably prove by the following simple example: If we compare the tone given off by the stem and the prongs of a fork held at equal distance from the ear, we hear the stem-tone of the A fork 13 seconds and the prong-tone 50 seconds; the stem-tone of the small *C* fork 10 seconds and the prong-tone 45; the stem-tone of the C fork 15 seconds and the prong-tone 50. Therefore, I say again, that the stem and the prongs of tuning-forks when used as a basis for testing the hearing are totally different things. Such equalization of values as Bezold would like to have is absolutely without foundation, and fatal, if upon it we build comparative investigations upon the nature of aërial and bone conduction.

At another place[1] Bezold concludes from Rinne's test that "under normal conditions aërial conduction always prepon-

[1] Ueber d. Funct.-Pruefung d. mensch. Gehoerorgans, Wiesbaden, 1898, p. 40.

derates largely over bone conduction." This conclusion, I reply, is deceptive, and deduced simply from the fact that the stem of the fork is tested from the bone, and then instead of testing the same stem by the air, they proceed to test the prongs by the air. If, as in all logically exact comparisons, scientific aurists would only take the same standard of measurement for bone and aërial conduction and test in each case with the stem instead of with the prongs (which are available only for aërial conduction) then we should see exactly the opposite to what is now asserted as the truth; namely, we should find bone conduction actually preponderating over that by the air. When the vibrating stem can no longer be heard by aërial conduction it can generally be heard by again placing it upon the bone, but. when no longer heard by bone conduction *it can never be heard again through the air.* The difference which has always been found in the tuning-fork tests hitherto employed, and which has been erroneously referred to the fault of natural differences in different paths of conduction, is really due to the different behavior of the stem and the prongs of the fork, and simply resolves itself into a purely quantitative preponderance of the so-called bone conduction, provided that the forks are correctly placed.

To the denial or to the lack of recognition of this essential truth is to be ascribed the reason why no one has hitherto attempted any revision of Helmholtz's theory, demanded, nevertheless, as it has been, by other considerations. So long as the authorities agreed with Bezold, that air conduction was more powerful than that by the bone, just so long were they compelled to conclude that the apparatus which they regarded as the characteristic and unique basis for aërial conduction, namely, the *Mt* and the chain of ossicles, must be of decisive influence in the conduction of sound.

This state of affairs has been additionally complicated by the assertions of Lucae and Politzer and the zealous furtherance of Bezold, that bone conduction, to be of any use, demands the presence of the entire middle-ear apparatus, and must additionally be called not only cranial but tympano-

cranial conduction. All such assertions can, nevertheless, be clinically shown to be far from substantiation, because, without any middle-ear apparatus, bone conduction can be plainly demonstrated, and because, theoretically, no arguments have yet been advanced to support them, as I have repeatedly urged in former papers.

Although I have here attempted to show the weakness and inadequacy of some of the arguments and proofs advanced in favor of Helmholtz's theory, I am well aware that the last word in so important a topic has not yet been said. The overthrow of such a theory, long since accepted by the leading *physiologists* of all lands, and supported by *clinical contributions* by the most skilled otologists, can only be accomplished by complete refutation of the observations that support it. Taking into consideration the enormous testimonial material in its favor, any comprehensive view of all the individual details is difficult to make, and a final judgment will only be rendered possible by the coöperative or the antagonistic labor of all who are competent in the matter at stake.

ANATOMICAL INVESTIGATIONS ON THE HYPERTROPHY OF THE PHARYNGEAL TONSIL.[1]

By J. HYNITZSCH, Strassburg.

(*With Plate C of Vol. XXXIV., German Edition.*).

Translated by Dr. O. Joachim, New Orleans, La.

UNIFORM views on the etiology of the pharyngeal tonsil have not yet been arrived at notwithstanding the discovery of the interesting physiological function of the tonsils by Stoehr, and their thorough pathologico-anatomical investigation by Strassman, Schlenker, Kruckmann, and Dmochowski. The similarity of symptoms presented by sufferers from adenoid vegetations in the pharynx to the complex of symptoms as seen in scrofulosis and similar constitutional anomalies, naturally suggested the idea that a latent tuberculosis was the origin of the hypertrophy of the pharyngeal tonsil. The attempts of Lermoyez and Dieulafoy to establish for this theory a firm basis by inoculation with particles from hyperplastic pharyngeal tonsils have, on account of doubtful results, failed to find the desired recognition. The results of the reactions of tuberculin met with a similar fate.

Equally inconclusive were the results of microscopic examinations of extirpated pieces of pharyngeal tonsils. Gottstein reports tuberculosis 4 times in 33 extirpated pharyngeal tonsils, and Brieger only 5 in 78 cases. On account of this uncertainty Professor Kuhn requested the

[1] From the University Ear Clinic of Strassburg.

author to subject all the pharyngeal tonsils removed in the ear, nose, and throat clinic of the Strassburg University to a careful microscopical examination for tuberculosis. In the course of this examination the fact became apparent that the common hypertrophy of the post-nasal tonsil presented anatomical changes worthy of a precise description. These examinations will be first described; 180 post-nasal tonsils were examined microscopically. In 49 cases the faucial tonsils were likewise enlarged. Five of the cases were a recurrence of the growth. Only 7 cases of the 180 pharyngeal tonsils showed tubercular changes, 173 simple hypertrophy.

I.—HYPERTROPHY.

In a large series of sections two types were especially apparent, which in most cases were easily distinguishable; in some cases, however, one merged into the other. A considerable increase in the *number of follicles* established the hypertrophy in one type, the varying intensity of the *interfollicular tissue* in the other.

The number of follicles often increased to such an extent as to occupy nearly the entire field of vision, leaving between them only small bands of interfollicular tissue. These follicles appeared frequently superimposed in 3–4 rows parallel to the surface in regular arrangement.

Besides this increase in number they varied so enormously in size as to permit at times their macroscopical recognition during the process of staining; at other times they were only microscopically recognizable as present in large numbers. Histologically they showed no particular peculiarities; they were round, consisted of finely reticulated leucocytes, and frequently stained intensely in the peripheral zones, whereby they were easily differentiated from their own centre and from the interfollicular tissue. The outlines of larger follicles were now and then obliterated and several of them appeared to form a large confluent area with a disintegrated centre, conveying the impression of a pus focus wherever it was not lost by manipulation. No epithelioid or giant-cells

of Langhans were observed, nor anything which pointed to tuberculosis. Trautmann and others have described similar pus centres in hypertrophied pharyngeal tonsils. The interfollicular tissue participated likewise, as above indicated, in the hypertrophy of this tonsil. In some sections it was extremely difficult to bring a follicle into the field of vision, especially as in these instances the tonsil seemed entirely composed of interfollicular tissue without any recognizable stripes of callous connective-tissue within the tonsil. Callous thickening of this kind was only to be seen in the fibrous connective tissue at the base of the skull with which the tonsil is connected. These bands never extended into the adenoid tissue of the tonsil.

Hemorrhages into the follicular and interfollicular substances were observed and noted to be a diffuse sprinkling of red blood corpuscles for a considerable distance into the adenoid tissue. Yellow pigment occurred between the cells and within the protoplasm of the leucocytes, evidently blood-pigment, easily observable with small magnifying powers, resolving itself under higher powers into a deposit of minute yellow granules, partly free in the tissue, partly within the leucocytes characteristic of pure pigment-cells. Some small and large clear and transparent bodies were scantily observed under small amplification, resolving themselves under higher powers into an aggregation of fine fibrinous threads interspersed with red blood corpuscles, which had lost their color during the process of washing out. The author attributes these latter formations and the shadows of blood corpuscles to spontaneous hemorrhages, the former to artificial hemorrhage of the operative procedure. Chalky concentrical deposits were observed only in single instances within the crypts and in the interfollicular tissue. Their presence had produced no abnormal condition in their surroundings.

The surface epithelium and the epithelial lining of the lacunæ, which extended at times quite deeply into the tissue, showed various conditions. Wherever the covering epithelium had not been artificially disturbed, stratified columnar epithelium, frequently well ciliated, or stratified squamous epithelium was observed, one frequently merging

into the other. The columnar epithelial cells showed frequently a basal nucleus and often a clear transparent condition, which characterized them as goblet-cells. Within the crypts stratified columnar epithelium was found quite regularly down to the depths of the lacunæ, stratified squamous epithelium rarely. Both varieties of epithelial covering were plentifully supplied with leucocytes, especially in the lacunæ, rendering the basement membrane indistinct and extending into the adenoid tissue. Quite different from the squamous epithelium, the columnar epithelium always appeared as a single layer, without proliferating processes on the surface. Two cases only were conspicuous by epithelial aggregation within the crypts. Their lumen was obliterated by an accumulation of fine ramified cords, which resolved themselves under high power into thin capillary tubes, covered like the crypt walls with columnar, resp. ciliated, epithelium. These fine capillaries could be discerned to arise and proceed from the adenoid tissue into the crypts by lifting off the epithelial covering and pushing it forward. The villous elevations showed great similarity to the papillomatous proliferations of the mammary and ovarian cystoadenoma. Wherever they were numerous they destroyed the epithelial covering by pressure, and the tubular lacunæ looked like glomeruli. Otherwise the contents of the saccular and tubular lacunæ appeared like mucus or pus.

Corresponding to the two varieties of epithelium the author found and differentiated two kinds of cysts: First, the *columnar*, and secondly, the *squamous epithelial cyst*. In no case does he remember to have seen them combined. The former varied in size from a microscopical body to a bean and appeared as a gelatinous formation of round shape, its walls lined with stratified columnar epithelium, covered with ciliæ wherever the contents had not caused their flattening by pressure. These cells were rarely of the goblet type. A well-defined basement membrane separated this columnar epithelium from the interfollicular substance, except at those places where the intercellular substance was infiltrated with leucocytes. The contents consisted of a clear, ropy mucus, often rich in leucocytes, with an

occasional red blood corpuscle. In two cases a large cyst contained considerable multinuclear elements — veritable giant-cells — varying in form and size, with single or multiple processes. The nuclei, greatly varying in numbers (as many as sixty), were of irregular order and never exactly along the line of the wall, and therefore essentially different from the giant cells of Langhans observed in tuberculosis.

They were easily recognized throughout all series of specimens. Smaller caudate cells with granular protoplasm were not infrequent. The author calls attention to the fact that this kind of giant-cell suspended in cysts has no relation to tuberculosis.

Squamous epithelial cysts were much rarer. They differed macroscopically from the former variety principally by their brownish-yellow jelly-like contents. These spherical cavities were lined with stratified, horny, squamous epithelium, which outlined itself against the surrounding tissue more distinctly at such places only where the individual epithelial strata were not infiltrated with round cells. Otherwise the basement membrane of the lining epithelium was well marked. These cysts contained horny lamellæ of concentrical arrangement, with an undefined centre filled with amorphous granular masses, many fat-globules, and cholesterine crystals. The latter were also present in the horny lamellæ as well as in the centre. The larger part of the crystals were dissolved by the ether used in mounting. The size of these cysts varied from an epithelial pearl to a Lima bean. In their microscopical structure they look like small cholesteatomata. Others, especially Tornwaldt, have made similar observations without, however, differentiating the two varieties.

The origin of these cysts is attributed by Tornwaldt principally to the pharyngeal bursa, which the author considers likely, especially as to the mucous cysts, but he claims for them, as well, the genesis of all retention cysts. A connection between the cyst and a true submucous gland could in no instance be established. Attention is called to the presence of numerous giant-cells and the aggregation of

cells in the mucous contents of open cysts lined with cylindrical epithelium.

The genesis of the cholesteatoma-like horny cysts may be best illustrated by their smallest variety, which could not be distinguished from the usual epithelial pearl. Such pearls were often met with at the point of an epithelial offshoot which extended from the surface into the deeper tissue. The author deducts the origin of this second variety of cysts from the continuous proliferation of horny lamellæ with central fatty and granular degeneration. They may occasionally be produced by occlusion of lacunæ lined with squamous epithelium by proliferation of adenoid tissue in their surroundings.

II.—TUBERCULOSIS.

In the history of the appended cases tuberculosis of the pharyngeal tonsil shows a uniform picture. Its clinical symptoms are in no way different from those of simple enlargement, which is the reason for the supposition of latent tuberculosis. The tubercular nature is only recognized by microscopical examination, which yields a characteristic picture most nearly resembling glandular tuberculosis.

Instead of adenoid tissue rich in follicles, small round areas are observed in varying number, distinguishable by the faintness of their stain. These areas become confluent and form broad lines of ill-stained tissue separated by narrow strips of well-stained adenoid tissue. The difference of color is most always visible to the naked eye. The periphery of these areas is formed of pale, elongated, so-called epithelioid cells; their centre of clear hyaline, partly granular cheesy masses. Typical giant-cells of Langhans are found among the epithelioid cells, which contain sixty and more parietal nuclei. A light mantle surrounds (halo-like) the nuclear ring and sends finely subdivided processes into the surrounding tissue. These undoubted evidences of tuberculosis were confirmed by the presence of tubercle bacilli in three instances.

The author denies the occurrence of chalky deposits, which were noted in three cases, as evidence for the presence

of foreign-body giant-cells. The giant-cells and the infiltration produced by foreign bodies in their immediate surroundings are never exclusively of the type of the giant-cell of Langhans, nor is the infiltration to be confounded with an epithelioid tubercle with a cheesy centre. The chalky deposits in the giant-cells are unquestionably secondary products like those occasionally found in giant-cells in tuberculosis of other organs. Gottstein has also described them in tuberculosis of the faucial tonsil.

The frequency of tuberculosis amounted to 3.9% in 180 cases of enlarged pharyngeal tonsil. Brieger found 6.4 % in 78 cases. Lermoyez found 6 %, *i. e.*, twice in 32 cases; Gottstein 12 %, *i. e.*, 4 times in 33 cases; Brindel also 12 %, *i. e.*, 8 times in 64 cases; Pluder and Fischer 15.6% *i. e.*, 5 times in 32 cases. The author found no case of tuberculosis in the first 52 cases he examined, which were followed by 3 positive cases at short intervals. In a relatively small number of examinations the influence of chance on the result cannot be denied. The pharyngeal tonsil had to be removed in 3 patients of the 7 affected by tuberculosis of the pharyngeal tonsil. It was found to be affected with tuberculosis but once. In 46 hypertrophied faucial tonsils removed, together with those affected with simple hypertrophy of the pharyngeal tonsil, no tuberculosis was found.

The author concludes that tuberculosis of the pharyngeal and faucial tonsils is a very rare condition and has no relation to the common and frequent hypertrophy. The enlargement is in the tubercular cases not due to the tubercular infection but to hypertrophy. The infection is to be regarded either as accidental or secondary,—a view which the author shares with others.

The question whether the tuberculosis in these few cases is primary or secondarily due to infection from other organs either through sputum or by way of the blood or lymphatic circulation, is difficult to decide. The diagnosis of primary tuberculosis of the lungs could in all the seven cases be made only in one, and was suspected in a second patient. The faucial tonsil is no less liable to primary infection than any other organ of the system.

CASE HISTORIES.

CASE 1.—Patient twenty-three years, female. Microscopic examination of the pharyngeal tonsil after removal shows tuberculosis. Family history negative. Examination of chest reveals nothing definite; both apices suspicious. Microscopic sections show large superficial, insufficiently stained, infiltrated areas which contain miliary and submiliary nodules with epithelioid cells, undergoing central cheesy degeneration and containing large multinuclear oval, less frequently round, cells. These cells vary in size. The nuclei, often sixty or more in number, are always parietal and surrounded by a zone of granular protoplasm. Fifteen or twenty giant-cells are often visible in one microscopic field; some of them seem filled with concentrically laminated chalky concrements. A peculiar green concrement appeared centrally in one of the giant-cells of irregular, hourglass-like shape, and of a concentrically but mostly of a radiating arrangement (Fig. 2, Plate C). Follicles are only sparsely present. Some gland convolutions are well preserved in the deep connective-tissue layers. The non-tubercular portions of the pharyngeal tonsil contain many well-preserved follicles. Ciliated columnar epithelium lines the lacunæ, which are filled with leucocytes and detritus. Rows of lymphatic corpuscles penetrate into the adenoid tissue through the columnar epithelium. Several vessels were completely thrombosed. In one tubercle nodule two tubercle bacilli were seen. The extirpated faucial tonsil showed the usual hypertrophy.

CASE 2.—Patient, eighteen years old, female. Previous history and physical examination reveal nothing. The microscopic examination of the enlarged pharyngeal tonsil showed infiltrated foci of varying size undergoing cheesy degeneration, epithelioid and some giant-cells of Langhans. The process involves both the follicles and the interfollicular substance. The follicles are well preserved and exhibit a distinct germinal centre. The columnar epithelium is better preserved in the lacunæ than on the surface. No tubercle bacilli.

One or more ramified capillaries were recognizable within the tubelike or slitlike lacunar depressions. They appeared to arise from adjacent adenoid tissue and to protrude into the lumen of the crypts, and were covered with a deep layer of glassy epithelium in continuation with the lacunar epithelium and showing in places ciliated lining. These ramified capillaries became occa-

sionally so dense as to occlude the lumen of the crypts and render the identification of the different tissues difficult. This condition has no relation to tuberculosis and was observed as well in other specimens of common hypertrophy (Fig. 4, Plate C).

Case 3.—Patient twelve years old, male. Purulent middle-ear disease in R. E. for three months; in L. E. for two months. Tubercle bacilli in sputum for a year past. Glandular enlargement in submaxillary region for ten months. Diagnosis: Otitis media chr. purul. duplex. Enlargement of three tonsils. The tonsils were removed and ten days later also tuberculous polypi from both ears. Bronchial breathing over both lungs. Shortened resonance above left scapula and in right infraclavicular fossa. Microscopical examination of the removed pharyngeal tonsils shows some superficial miliary foci which contain epithelioid cells, a variable number of giant-cells with central cheesy degeneration (Fig. 1, Plate C). The greater part of the tonsil shows simple hypertrophy of the interfollicular tissue. Stratified squamous epithelium covers the larger part of the gland and lines the lacunæ. The hypertrophic faucial tonsil shows no tuberculosis.

Case 4.—Patient fourteen years old, male. A yellowish-brown material escaped from a cyst during the removal of the pharyngeal tonsil. The microscopical examination of the cyst shows smooth walls covered with stratified squamous epithelium on a basement membrane. Leucocytes infiltrate the epithelial lining. The upper epithelial layer was composed of concentric horny lamellæ, which towards the centre became less distinct, amorphous, granular, and interspersed with fat-corpuscles. Sharply outlined oblong spaces could be seen in the horny layer. They had evidently contained crystals and some were still recognizable by their lustre. Other cysts the size of a pinhead or an epithelial pearl were noticed. The smaller ones preserved the lamellar character of their contents to their centre; the contents of the larger ones approached the type above described. The rest of the tonsil was distinguished by an increase of the follicles and interfollicular tissue. Stratified squamous epithelium replaced the columnar variety everywhere even in the lacunæ. Solid epithelial proliferations protruded into the adenoid tissue containing epithelial pearls. Horny lamellæ encroached upon the lumen of the crypts. Numerous capillaries and larger vessels were thrombosed.

Explanation of the Plate.

FIG. 1. Tuberculosis of the pharyngeal tonsil.

FIG. 2. Giant-cells with a chalky concrement.

FIG. 3. Section through the wall of a squamous epithelial cyst containing cholesteatoma.

FIG. 4. Papillary excrescence of a crypt.

REPORT ON THE NINTH MEETING OF THE GERMAN OTOLOGICAL SOCIETY AT HEIDELBERG, JUNE 1 AND 2, 1900.

By Dr. SELIGMANN, Frankfurt-a.-M.

Translated by Dr. C. Zimmermann, Milwaukee, Wis.

MEETING JUNE 1ST, AT 9.30 A.M.

Chairman : Kessel, Jena.

Business Meeting.

In the absence of Lucae, Kessel opens the meeting with a sketch of the program of the ninth session. An address of welcome was given in the name of the city by Mayor Walz, in that of the Medical Faculty of the University of Passow, for which Kessel returned thanks. Passow reports that the House of Representatives of Baden had concluded the erection of an ear clinic at Heidelberg, and an institute for the partially deaf. Breslau was selected as the place of the tenth meeting. Twenty-one new members were admitted ; three had died, whose memories are honored. The membership is 238. Bezold, Bürkner, Habermann, Hartmann, Kessel, Körner, Lucae, Siebenmann, Wolf, were elected as members of the executive committee. Contributions were solicited for the Troeltsch memorial. In Bavaria, Prussia, and Baden a movement in favor of securing otiatric services in deaf-and-dumb institutions has been made by appropriating funds and instituting courses. Hartmann proposes to establish a centre for the examination of petrous bones of deaf-mutes, for which purpose a committee is appointed. Hartmann reports on the International Otological Congress at London.

Habermann (Graz) is elected as first president, Siebenmann as second president ; Hartmann as first, Körner as second secretary.

Scientific Meeting.

Addresses of Drs. KILLIAN and ZARNIKO introducing a general discussion on **diseases of the accessory cavities of the nose.**

KILLIAN reports on the **present state of therapy of inflammations of the ethmoidal cells and sphenoidal sinuses,** the operative treatment of which was initiated by Schaeffer, Hajek, and Grünwald. K. believes that rhinoscopic media, devised by him, will prove an essential progress.

The treatment of acute inflammations is at first expectative: rest, applications, inhalation of steam, sniffing of warm physiological solutions of salt, diaphoresis, antineuralgics, narcotics, no intranasal manipulations. If the acute and chronic affections do not disappear, the sinuses have to be opened intranasally or extranasally. The intranasal procedures are easy, and preferable in wide, accessible noses, or in narrow noses if dilatation is possible, *e.g.*, by submucous resection of deviated septa, or resection of the anterior extremity of the middle turbinated body, or the whole of it (scissors or nasal forceps). K. here recommends his speculum for rhinoscopic media, which renders the olfactory fissure accessible for operations, with preservation of the middle turbinate (ozæna). The ostia of the frontal and infundibular ethmoidal cells can only be exposed by removal of the laterally projecting processus uncinatus (scissors, snare, Hartmann's forceps). After the ethmoidal and sphenoidal cavities are rendered accessible they are opened from the ostia by perforating their anterior walls (Hartmann's forceps) and removing their septa. The upper nasal meatus and its cells are best reached by piercing the posterior wall of the bulla, scraping with sharp spoon, tamponing with gauze, and after-treatment by touching with cotton soaked in a 2–5 per cent. solution of nitrate of silver. The extranasal operations have to be resorted to if, in inaccessibility of the inner nose, severe affections require an opening, either orbital or maxillary. The orbital opening is obtained by osteoplastic resection of the nasal and frontal bones and the frontal process of the upper maxilla, with preservation of the trochlea to avoid diplopia.

ZARNIKO reports on **maxillary and frontal sinuses.** The treatment is either causal, by the extraction of carious teeth, especially when filled (the roots of which can be examined by Roentgen rays); expectant, conservative, by establishing sufficient drainage; or radical, by wide opening and scraping. The ex-

pectant treatment is the same as in the acute form : rest in bed, ice, antineuralgics, brushing the nose with 2 % solutions of cocaine, to enlarge the natural ostia and remove the secretion. The other methods are indicated if chronic suppuration has set in. Probing of the cavities through their natural opening must precede the operation.

1. Conservative surgical treatment : Opening of the maxillary sinus by trocar or sharp canula in middle or inferior nasal meatus or from the alveoli of the second premolar or first molar tooth, with an at first fine and then a larger (0.5 *cm*) drill rotated by an electromotor, and smoothed with a burr. Gauze-tamponing, irrigation. Towards the end of treatment the lumen must be kept open by a wire plug. The canine fossa may be perforated also with Kirstein's nail trocar, which, however, leaves holes that can not be found a second time. A permanent opening is made after dissection of the soft parts from the mucous membrane and displacement of the periosteum with the electric trephine, under cocaine, not in narcosis. The hole must be 0.5 *cm* wide, and kept open by iodoform-gauze or a prothesis fastened on a tooth.

The frontal sinus is opened by a small incision from the eyebrow or the interior of the nose with a perforator, between middle turbinated body and septum, or with the electric trephine (Roentgen rays), all of which are dangerous methods.

The perforation with subsequent repeated irrigations may be done previously to the broad opening in acute and chronic fetid suppurations. The result has to be watched, even after healing or relief is obtained, as long as a slight suppuration persists. In deeper affections, caries or necrosis, the sinus has to be widely opened for removal of all diseased parts, and careful watching of the healing process.

All methods are mentioned and criticised in detail ; we can only report the most important.

The canine fossa is the only place where, in narcosis, the maxillary antrum is opened by removal of the entire anterior wall with chisel and bone forceps after previously making a trephine hole of 6 *mm*. Scraping with preservation of healthy mucous membrane, tamponing, later on irrigations, and application of lunar caustic. Until complete healing, which may be accelerated by Thiersch grafts, the wound is kept open by an obturator devised by Z. Then it is allowed to close. (Jansen, Boenninghaus.)

The frontal sinus is opened in different ways by different

operators, on account of cosmetic reasons; at the same time the ethmoid cells must be opened. Kuhnt incises the eyebrow and removes the whole anterior wall (chisel, forceps), which causes quite a disfigurement if the sinuses are large and deep. Jansen removes the lower wall of the sinus from the orbit, with simultaneous evacuation of the ethmoid bone after cutting away the os planum. But also then disfigurement and infection of the orbit are to be dreaded. Killian takes away the anterior and lower walls, leaving a bony ridge at the orbital margin, introduces a probe into the naso-lachrymal duct, and resects temporarily the nasal bone and the upper portion of the frontal process in form of a flap, which contains also the soft parts, and is replaced and sutured. Irrigation from the nose. Czerny performs the osteoplastic reflexion of the whole anterior wall. Through a hole cut with the chisel the sinus is explored as to its dimensions, and a flap formed with its base upwards and outwards by temporarily resecting the nasal bone and the frontal process, which, after the communication with the nose has been restored, is replaced and sutured. Winckler performs this operation on both sides, if affected, in one sitting.

Discussion.—KÜMMEL: Appropriate intranasal treatment helps essentially to prevent spreading of the suppuration to the accessory cavities. The suppuration is mostly benign. I have opened many accessory sinuses and I never saw caries. The statistics of the clinic showed 35 openings of the maxillary sinus: in 13 nothing was said as to recovery; 11 were healed by widening of the nasal orifice; 2 cases were operated on from an alveolus, the others from the canine fossa, all with bad results; 1 complicated by abscess of the cheek. The best results were obtained by enlarging the nasal ostium and subsequent irrigation, which the patients learn to do themselves. The same was observed in affections of the frontal sinuses: in 6 the result was doubtful, 4 healed by irrigations, 3 by operation, 1 with negative result. Patients with empyema of the ethmoidal and sphenoidal sinuses generally abandoned treatment, although far from being cured. I consider as a cure: not only subsidence of suppuration, but also of fetor. Cases cured by operation are extremely rare.

JENS: I also prefer intranasal treatment, especially irrigations, but for the maxillary sinus from the secondary foramen, not from the narrow hiatus, which lies very high. The ethmoidal cells cannot always be reached in operations from the maxillary sinus

without danger to the orbit. Resection of the nasal septum is not necessary for the opening of the ethmoidal cells, which can be effected under cocaine by introducing a long, narrow chisel along the upper margin of the middle turbinated body. Once I observed orbital emphysema after profuse hemorrhage by violent blowing, but it healed by incising the conjunctiva. The affections with intense fetor recover easier than those without it.

BRIEGER: The danger of suppuration of the accessory cavities is small, according to statistics of my own and of my assistant, Wertheim. Among 10,000 deaths, 6 were caused by it. Of 800 autopsies, 180 (20 %) showed affections of the accessory sinuses. Of these 180, 3 died from it, 1 from cerebral abscess, 2 from meningitis. The ears had been examined in all cases. The maxillary sinus undoubtedly has a tendency to spontaneous recovery after removal of the pus. On account of the sinuous structures of the frontal sinus more scattered foci of suppuration were found, which rather require operation. Such separated foci were also observed by B. from the osteoplastic method, in spite of free drainage towards the nose. In general, the treatment must be varied according to the discomfort caused by these suppurations.

SCHEIBE: I also consider the suppurations of the accessory cavities less dangerous than those of the ears. The cause of death in such cases requires still a careful study. I prefer the conservative method, guarding against noxious factors, as smoking, alcohol, work, instillations, cocaine, snuffs (collapse of the turbinated bodies), irrigations. I puncture the maxillary sinus from an alveolus, and keep it open by a plug manufactured by a dentist. I very rarely have seen necrosis, which explains the rare occurrence of death. The secretion diminishes rapidly after irrigation, but does not always cease entirely; it increases with new attacks of catarrh.

ZARNIKO: The speculum of Killian for rhinoscopia media enables one familiar with its use to detect a drop of pus oozing from the ostium of the frontal sinus.

MANN: I puncture the frontal sinus from outside for exploration, and then, if necessary, chisel away the bone in lamellæ. If the endosteum proves normal, I close the wound; if reddened, I make a large opening.

KÜMMEL: Careful intranasal treatment is preferable to a large opening, since the after-treatment lasts very long and gives the same result.

ROBINSOHN : In probing, the anterior ethmoidal cells are easily reached and may be mistaken for the frontal sinuses. I penetrate into the maxillary sinus with Krause's trocar from the inferior nasal meatus, and irrigate with hydrogen peroxide 5 %. In general more operations will be performed on the polyclinic material than in private practice.

WALB : How difficult probing and irrigation of the frontal sinuses is, is shown by the fact that it very rarely succeeds. It is better to open them widely from outside. The incision laid in the eyebrow is not seen later.

v. WILD : I prefer the natural ostia for irrigation. If these are wide, the sinuses are predisposed for disease. I open the maxillary sinus from the canine fossa with trocar, and irrigate with hydrogen peroxide, and let the patient wear a plug.

Discussion continued at second meeting at 2 P.M.

JANSEN : We may not always consider it essential to stop the suppuration entirely, but there are patients who absolutely wish to get rid of it. An undoubted indication for operation is given, if the empyema has broken through into the neighborhood — for instance, in imminent or formed extradural abscess. The sinus is then generally enlarged, which in the frontal sinus may be observed by bulging of the anterior wall. The suppuration, not infrequently, starts in the maxillary sinus and infects all other sinuses, therefore the operation of the former may protect the latter. Not statistics, but the individual cases decide as to operation. The operation gives the best results in the frontal sinuses, which I open wide by removing the anterior and inferior walls with curettement of the diseased ethmoid. The disfigurement is great only in large sinuses. The size of the sinus may be diagnosed by transillumination. In combined chronic suppurations I have lately avoided the opening of the frontal sinus from outside by entering it from the maxillary sinus (the anterior wall of which having first been removed), through the diseased ethmoidal bone upwards and in front, and around the eyeball, under control of my eyes and fingers, thus establishing free drainage. The complete curettement of the ethmoidal bone from the maxillary sinus rarely succeeds in one sitting, but it is easier than from the nose. The cells covered by the eyeball and projecting laterally are more safely exposed during the after-treatment. During the latter, the access to the ethmoidal cells and sphenoidal sinuses often grows narrow by cicatricial membranes, which must be excised. For years

I transplanted epidermis according to Thiersch into the maxillary sinus and shortened the after-treatment, not requiring the frequent scraping of granulations. The anterior wall becomes cicatrized latest, as it generally is kept moist by pus from the frontal sinus, My Thiersch's transplantations amounted to almost two hundred. The treatment requires six months and more, and the patients must be under medical control for years. I enter, of course, the sphenoidal or frontal sinus only from diseased maxillary and ethmoidal sinus.

HARTMANN recommended, as early as 1883, irrigations from the middle meatus, not through the natural ostium, but through an artificial hole in the thin lateral wall. Irrigations with hydrogen peroxide may bring about a complete cure even if thick, cheesy masses are in the middle meatus or in the sinus. The opening through the canine fossa and insertion of a drain may be done under cocaine with a thick drill after incising the skin and displacing the periosteum. The patients do the irrigation themselves. If recovery is not obtained, a radical operation is performed. The suppuration of the frontal sinus sometimes is cured after that of the maxillary sinus has disappeared. Probing may be deceptive, as often the anterior ethmoidal cells are struck. The complete obliteration of the frontal sinuses from the start is not always necessary; the chief point is free drainage towards the nose by removing the anterior cells. H. recommended to make one opening in the forehead and another in the medial orbital wall; through the latter the septa are removed. For the obliteration of the frontal sinus, the corners especially must be carefully scraped to remove all mucous membrane and granulations.

BECKMANN formerly opened the sinus from outside, but with unfavorable results; he prefers irrigations, by which he cured thirty maxillary sinuses within six months (puncture with trocar from the middle meatus). The causes of maxillary empyema frequently are decayed teeth, empyemata of frontal and sphenoidal sinuses, which also must be cured. For diagnostic purposes B. blows air through the trocar to ascertain the presence of secretion, which succeeds easier in the maxillary than in the frontal sinus. Often we cannot be sure whether we have entered the latter. An opening from the mouth, ever so small, must not be made. If the irrigation fluid runs out clear, the cavity may be dried by an air douche. B. opens the frontal sinuses from the ethmoidal bone; very rarely he had to resort to the extranasal method.

ROEPKE also prefers intranasal opening of the upper cavities for cosmetic reasons.

HINSBERG: After opening of the maxillary sinus from the canine fossa we often find hypertrophy of the mucous membrane from stagnation of pus; after evacuation of the latter the swelling rapidly subsides. The communications with the mouth must be carefully closed by obturators to prevent the entrance of food. H. punctures the wall from the middle meatus with fine scissors, cuts backwards, and enlarges the hole with forceps. This is difficult in narrow noses. The hole remains permanent. The treatment is short, since the distressing symptoms soon cease and the secretion becomes scant. On account of the lachrymal duct the hole must be made behind the maxillary foramen. The introduction of instruments into the frontal sinus can be controlled by the Roentgen rays.

VOHSEN: In spite of the slight danger for the brain, empyema of the sinus must be cured, on account of the lungs (inspiration), and the stomach (swallowing of pus). We ought to operate in such a way that we see what we do. I make small holes allowing endoscopy. In very deep frontal sinuses the scars are disfiguring. V. demonstrates instruments for transillumination.

ZARNIKO calls attention to the disappointment following the results formerly expected from these operations. Extranasal procedures cannot be discarded. He saw a large number of recoveries due to them alone. The after-treatment is most important, just as in middle-ear operations. Any tamponing causes irritation—also Jansen's obturator. It is generally conceded that the establishment of an outer opening may be delayed for a long time, and this is the chief result of the discussion.

KILLIAN: The practice of rhinoscopic media is safer, better, and less dangerous than the palpation with the finger as recommended by others.

DENKER: Contribution to the **anatomy of the hearing organ of monotremata.**

SIEBENMANN: 1. **New investigations on Corti's membrane.**

2. **Microscopic sections of the petrous bone of a deaf-mute.** Cochlea normal, except total absence of Corti's organ, only on one place of the middle turn a rudiment of it; the narrow marginal zone is slightly developed. Where Corti's organ ought to be, the membrane is displaced downwards over the great

epithelial ridge and almost fills the internal spiral sulcus. The epithelium of the macula acustica, the utriculus, and sacculus is preserved. Apparently deaf-mutism was caused by this defect.

HARTMANN: On **irregular development of the frontal cells.**

H. gained a clear view of the complicated conditions of the anterior ethmoid cells from the embryological investigations, especially of Killian, whom he asks to explain the embryological conditions on his illustrations.

KILLIAN found on five hundred half-skulls of human embryos, that in early stages of development the nose contains six turbinated bodies. The uncinate process is also a rudiment of a turbinate. From the fissures between the three upper turbinated bodies, three ethmoid cells develop. There are still many additional turbinates, one in the upper and many in the middle meatus. Three upper and three lower succenturiate turbinates with their fissures are found regularly, from which the frontal sinus and the bulla ethmoidalis develop.

Hartmann demonstrates the arrangement of the cells in adults partly in specimens, partly by pictures of his atlas just published: defects of the cells, regular arrangement, and several specimens of irregular arrangement of the cells, which can be also explained by the normal type. The frontal sinus shows three cells, an anterior, lateral, and posterior; the ostium of the frontal sinus always is on the medial side of the ostia of the cells. H. demonstrates the hernious development of the frontal sinus, as he called it, in a specimen.

BEZOLD: **An analysis of Rinne's experiment.**

Bezold maintains his views on the significance and value of Rinne's experiment with reference to the views expressed by Zimmermann, of Dresden, at the previous congress of the Society and more fully in a paper published in the German edition of these ARCHIVES. Both articles will be translated and published in our next issue. There was a discussion which Bloch ended by the remark: "The well-ascertained results of our methods of examination render a discussion superfluous."

MEETING JUNE 2d, AT 9 A.M.

PASSOW: Exhibition of patients.

Passow demonstrates several cases; in one of these the lower labyrinthine wall had been trephined to evacuate suspected pus. A

canal, 4 *cm* in length, was reached running inwards along the base of the skull. Even now, after several months, pus oozes, the source of which is doubtful.

HARTMANN advocates the appointment of a committee for anatomo-pathological examinations of deaf-mutes, to which specimens may be sent with histories by any observer who has not the time or means to examine them himself. A committee of five is appointed.

SCHWENDT: Determination of number of vibrations with Kundt's dust figures. S. tested the various Galton pipes with Kundt's dust figures under manometric pressure as to their pitch and upper tones. Edelmann's Galton pipe is rich in the latter. According to acoustic laws, their proportion to the basal tone is 3:1. In a certain width of the mouthpiece and constant air-pressure, the upper tones cannot be made out, which is of practical importance. The latest pipe of Edelmann's yields higher tones than the former. In the harmonica of Urbantschitsch, upper tones from c^1 to c^3 can be demonstrated by the dust figures. Finally the dust figures of different tones of Galton pipes, in harmonic proportion, are shown in Kundt's tubes.

Discussion.—BEZOLD: Edelmann does not perfectly agree with the investigations of Schwendt.

WANNER: On **shortening of the bone-conduction after traumatism of the skull.**

The following observation leads me to a preliminary communication: A man fractured his frontal bone; healing in of a bone fragment with deep depression. Nine months afterwards he stayed in a psychiatric clinic for two weeks. With Roentgen rays a dark spot of the size of a hand was found at the scar. This and vertigo (especially in bending forward), headache, pricking, roaring, fatigue, obliviousness, intolerance of alcohol, intense swelling of the retinal veins, led to the diagnosis: narrowing of the capacity of the skull by chronic thickening of the meninges. Air conduction normal, bone-conduction much diminished. Diagnosis: callous and extensive adhesions between bone and dura. In looking for similar cases W. found one of epilepsy with chronic alcohol-neuritis after old traumatism, where also the bone-conduction was diminished, Rinne's experiment prolonged; the post-mortem examination revealed extensive adherence of the thickened dura to the skull. Several other cases of injury and some of intense alcoholism exhibited the same symptoms at the hearing test.

Discussion.—BEZOLD: I also examined the first case, which showed the same condition of hearing as in severe affections of the inner ear.

BLOCH: On the **etiology of adenoid vegetations.**

Adenoid vegetations, *i. e.*, the non-acute inflammatory hypertrophy of the pharyngeal tonsil in children, are chiefly hereditary, as was made known by W. Meyer, Loewenberg, and Simon; still more exact studies are lacking. They would require the examinations of a larger number of generations of the same family. This cannot be done very well if we wish to examine the naso-pharynx in all cases. If we consider the peculiar formation of the face, as found associated with adenoids, as a sufficient pathognomonic symptom of the presence of a large pharyngeal tonsil, we may infer the heredity from pictures. As other obstructing affections of the naso-pharynx are extremely rare in childhood, I think we may diagnose adenoid vegetations from the so-called adenoid type of the face, as large lower lip hanging down, short and thin upper lip (rarely both thickened), the leptoprosopic appearance, wide palpebral fissure, broadened osseous dorsum nasi with relative or absolute narrowing of the alæ.

Several pictures from different stages of life are necessary to determine whether a family member belongs to that type. (B. shows the picture of a girl, normal at fifteen, marked adenoid at twenty-five years.) Pictures which show features voluntarily influenced must be excluded (lips pressed together). From such a formation of the face we may deduce hereditary adenoids in the family of Emperor Carl V., of whose family pictures for a space of more than half a millennium are preserved. The adenoid type of Carl V. is known (W. Meyer) and proven in his brother Ferdinand I. by R. Kayser from a picture painted by Lucas van Leyden. B. traced on pictures the heredity of this type in the genealogy of Carl and Ferdinand, and on more than one hundred pictures, collected within three years, he could prove it back to the first half of the fourteenth century and onward to the year 1700. From there the adenoid physiognomy ceases (demonstration).

Discussion.—SIEBENMANN: Adenoid face is an abbreviation of expression, not an anthropological term. Narrow nose, open mouth, prominent lower jaw, sometimes prognathy causing imperfect union of teeth, are not always associated with hypertrophic pharyngeal tonsil; it is generally only medium-sized. I

would not indiscriminately apply the expression adenoid face to the pictures demonstrated.

BRIEGER: I do not attribute such importance to heredity in adenoid vegetations, although the latter is apparent if members of the same family are simultaneously affected by them. Tuberculosis, hereditary syphilis, leukæmia, may present the aspect of hypertrophy of the pharyngeal tonsil.

BECKMANN: Hypertrophy of the pharyngeal tonsil and adenoid vegetations must not be confounded. With hypertrophic pharyngeal tonsil, a face with broad dorsum nasi, not narrow nose, is associated. I do not consider the Hapsburg face as such. The pharyngeal tonsil produces all kinds of inflammations of the upper air passages; and here lies its importance.

BARTH: Measurements of skulls of different races showed that this form of the face occurs more frequently with than without adenoids. The shape of the face does not depend upon that of the skull; the length and height of the palate must in statistics not be considered of equal value in adults and children.

KOERNER: The shape of the face should be considered in genealogical tables, which, however, can be carried through in three generations at the highest. In my own family, which is not adenoid, one person who married into it is adenoid and all his children.

BLOCH: The object of my paper was to stimulate investigations in families. I also saw a change in the type of the face by intermarriage with non-adenoid persons, but a recurrence of it in later generations.

MANASSE: Demonstration of microscopic specimens of **so-called ankylosis of the stapes of both petrous bones** of a man aged fifty-two. The right circular ligament is partially ossified; almost half of the cochlear capsule is covered by spongioid masses. The plate of the left stapes is completely adherent to the foramen ovale and changed to spongy bone; the border of stapes and bone cannot be distinguished. The process is rather recent, as medullary spaces and Howship's lacunæ are present. Sections of another case showed ankylosis by calcification at the margin of the oval window without ossification.

HANSBERG: Demonstration of the specimen of an **abscess of the temporal lobe**, with clinical history. The case showed only shortly before death severe focal symptoms, although a larger

number of old cerebral abscesses were present in the middle and posterior cranial fossæ. The process had started in the latter.

MEETING JUNE 2D, AT 1 P.M.

VIERECK: **Ligation of the internal jugular vein in operating for thrombosis of the sinus** is not yet generally adapted on account of some slight danger connected with it and impeding the outflow of the facial and cranial veins. Therefore its beneficial effect ought to be set forth by large statistics, from which, however, must be excluded: death from other causes, from meningitis and cerebral abscess, delayed operation, previous metastases, and ligating the thrombosed vein. According to this principle, Viereck collected 108 cases out of 170, of which 94 showed uncomplicated thrombosis of the sinus, 14 thrombosis of sinus and jugular vein. In 40 of the former the jugular vein was tied, in the remaining 54 not. The results were:

Ninety-four cases of uncomplicated thrombosis of the sinus.

	40 with ligation	54 without ligation
Died from pyemia	6 = 15%	13 = 24%
Cured:	34 = 85%	41 = 76%
Of these were		
Cured without complications	28 = 70%	14 = 46%
With fever or metastases	6 = 30%	27 = 54%

Fourteen cases with thrombosis of sinus and jugular vein.

	14 with ligation	2 without ligation
Cured without complications	12 cases	0
With metastases	0	2 cases

After reporting a number of cases from the clinic at Leipzig and carefully criticising various considerations with regard to ligation, Viereck sums up: Ligation prevents pyæmic infection with greater safety than simple opening of the sinus. Therefore it ought always to precede the latter. Thus breaking of thombi and aspiration of air are not to be feared.

Discussion: See below.

WEIL: **Contribution to the clinical knowledge of otogenous pyæmia.** Boy, aged thirteen, after removal of pharyngeal tonsil — acute right otitis media, mastoiditis, opening of mastoid; however, pyæmia, formation of sequestra, erosion of the wall of the sinus, frequent hemorrhages; tamponing, after which the temperature always rose. Complete recovery in five months.

KEIMER: **Extradural abscess of the middle and posterior cranial fossæ** with diagnosis difficult. Acute otitis media, violent pain, severe general symptoms. Opening of mastoid, a focus of the size of a bean, small antrum filled with pus, temperature fell to normal. Very intensive intermittent headache with nystagmus. In the fifth week œdema in and behind petrous bone. Trephining: Removal of the upper wall of meatus, evacuation of an extradural abscess from the middle cranial fossa, and, after enlarging the wound of the bone, also of the posterior fossa. Recovery. Final hearing, 6 *cm* for whisper.

Discussion.—BARTH: Hemorrhages from such wounds do not always come from the sinus, but from the smaller veins which are under high pressure.

MANASSE: Extradural abscesses may exist without any symptoms, which were marked only in three of my fifteen cases.

The ligation of the jugular vein is no matter of predilection. Statistics must consider the time between commencement of thrombosis of the sinus and ligation. The earlier the latter is done, the better the prognosis. Those operated upon on the first day all recovered. Of my cases of ligation of the jugular vein only one was saved.

KÜMMEL: Each case is a study for itself. If a solid thrombus is found in the sinus, we may wait and ligate at a second sitting. A thrombus in the jugular vein may be forced into the lungs during ligation; feeling of pressure and dysphagia are no indications for ligation, but the first sign of metastasis in the lungs is. Then the vein must be incised and resected in its whole length.

JENS: In a case of necrosis following a mastoid operation I could elicit nystagmus by touching the granulations at the upper wall of the wound.

JANSEN: The jugular vein is only to be tied when diseased or when it contains an infected thrombus. The headache in extradural abscess is of neuralgic character, but exacerbates regularly at night. Nystagmus occurs rarely.

ESCHWEILER: The large calibre of the sinus explains the pressure which causes the blood to squirt. The assumption of an abnormally high blood-pressure in such cases is not necessary.

SCHEIBE: The prognosis depends upon the quality of pus and whether a case is acute or chronic. If symptoms of otitic pyæmia arise, the middle ear must be thoroughly scraped even in acute cases.

BARTH: If the sinus looks diseased, the jugular vein must also be exposed, since it may contain pus, even without thrombus, in its lumen or wall. It is tied twice and the upper portion incised.

JANSEN: The fever always originates in the circulation, *i. e.*, the sinus and its central continuations. Thus the middle ear requires no further attention. Yellow discoloration of the sinus wall is unimportant; the explorative puncture is determining, but not as to the existence of a parietal thrombus. The latter may be loosened by chiselling. If we are convinced of its existence, which is scarcely possible, the internal jugular vein should be ligated.

BARTH: Ligation of the jugular vein should always precede the opening of the sinus.

BRIEGER: The middle-ear affection may have been cured and still pyæmia may occur.

WEIL: I could leave the tympanic cavity intact in my case, not only for the reasons just mentioned, but also on account of sufficient drainage.

SCHEIBE: **Necrosis of the mastoid in acute otitis media.**

Acute suppurations of the middle ear are followed by ostitis; chronic, by necrosis of the bone. Special dispositions produce necrosis after acute suppurations, as youthful age, particularly childhood. In adults disturbances of nutrition act that way. This is proved by 53 cases of acute otitis media operated upon by me. Necrosis developed in 6 cases after, in 7 before, operation. All showed disturbances of nutrition: 5 tuberculosis of the lungs, 5 sepsis, 2 diabetes. The bacteriological examinations revealed in 7 streptococcus pyogenes, 1 simultaneously staphylococcus, 2 staphylococcus, 1 ozæna bacillus. Diplococcus pneumoniæ, otherwise common in acute otitis, was not found. I call the bone necrotic if it is bare and shows white discoloration. Results: In 5 of the 7 necroses before operation no sequestra separated except in 2; in the 6 necroses after operation the necrosis lasted until death. In 6 the wound remained completely open, in 3 partially. The 40 cases not complicated by necrosis healed all except 3 which died from intercurrent diseases. The average time of healing was 7 weeks for the 40, 14 for the 13. The prognosis of an aural suppuration, therefore, depends on the existence and nature of disturbances of nutrition.

Discussion. — EULENSTEIN is treating at present a case with a mummified bare piece of bone after subsidence of suppuration.

FRIEDRICH also found in a case of ozæna, ozæna bacilli in pus from the ears.

KREBS: Childhood predisposes very much to necrosis; especially children with hereditary syphilis present serious cases.

DREYFUSS: The ozæna bacillus is not yet certainly determined, perhaps it is identical with the bacillus of Friedländer.

SPORLEDER: Demonstrations: 1. Sclerosis of the auditory nerve after typhoid with hearing tests and microscopical sections. 2. Acute fatty degeneration of the trunk of the auditory nerve and atrophy of the cochlear nerve.

LAUTENSCHLÄGER: Demonstration of an apparatus for the treatment of the ear with dry air for the shrinking of granulations and drying the cavity after radical operations, and in perforations of the *Mt* instead of powder.

RUDLOFF: On the **perforation of the nasal septum in people working with chrome.** After discussing the opinions so far in vogue, R. reports his observations on a large number of employés in a factory at Biebrich. He found the seat of perforation behind the line where the pavement epithelium ceases, which grows from outside about 1 *cm* into the nose. Thus the pavement epithelium protects against cauterization. On the first day a grayish-white spot of ½ to 1 *cm* in diameter is found, which spreads and leads to perforation sometimes as early as the second day. Some had epistaxis on the first day; holes were found on the seventh day. After working one year in the factory no laborer was found healthy; after leaving, the ulcers healed. The perforation spreads towards the back of the nose, but the latter does not sink in; a small bridge is preserved above. The process does not always stop at the end of the bone; it also spreads to the lateral wall of the nose, causing ulcers of the mucous membrane. A connection of the disease with erosions or wounds of the skin could not be found. The width of the nose is without influence. But the cornefied epithelium at the anterior extremity of the lower turbinated body furnishes a protection, so that only the portions covered with ciliated epithelium are invaded. The cause is undoubtedly not traumatic; which shows the regular occurrence always at the same place and the extension to regions of the septum and lateral wall inaccessible to the finger.

HANSBERG: Contribution to the **operation for abscess of the temporal lobe.** In two cases, in which the opening of the abscess from the tegmen tympani did not effect sufficient drainage, the latter was obtained by a counter-opening through the squama, as proven in one case by the autopsy.

After the chairman had extended his thanks to the magistrate of Heidelberg, the local committee, and the members, the Society adjourned at 4 P.M. Ninety-three members were present.

REPORT OF THE SECTION ON OTOLOGY AND RHINOLOGY AT THE THIRTEENTH INTERNATIONAL MEDICAL CONGRESS, PARIS, AUGUST 2–9, 1900.

By Dr. M. BELLIN, in the "Gazette des Hôpitaux."[1]

Translated by Dr. Arnold Knapp.

Dr. Gellé, president of the Otological Congress, delivered the introductory address, and Professor Politzer pronounced a eulogy on the celebrated Belgian otologist, Delstanche. The first question of the day was on **acoumetric notation, a project of unification.**

Reports were read by Schiffers (Liège) and Hartmann (Berlin). Hearing tests in general seek to localize the aural lesion and to determine the auditory acuity. In the former case the tests are not of equal value; in the latter the difficulties are great, for two reasons: the first and physical one, perception of sound takes places by the solid or bony way and by the aërial; the second and psycho-physiological, the ear is especially trained by education to perceive articulate speech. In addition, a discerning and analytical faculty is present, a differentiation of complex sounds of the various words in a spoken sentence. It is very difficult to notate the latter in a simple and clear manner.

The various methods and instruments employed by aurists were then described. Schiffers's conclusions, to which Hartmann also arrives, are the following:

1. The watch and all kinds of acoumeters without gradation cannot serve for the minimal fundamental notation; moreover, as the intensity varies with the distance, this procedure cannot be used to test contact hearing.

[1] In order to furnish our readers with an early report, we took the exceptional liberty of translating the elaborate report of Dr. Bellin in the *Gazette des Hôpitaux*, le 21 Août, 1900.

2. The tuning-fork is the best instrument to measure the hearing. The optical method is a decided step in advance, probably capable of further development.

3. The hearing acuity measured by tuning-fork is expressed by a fraction where the numerator denotes the duration of hearing in seconds and the denominator gives the normal-hearing duration. It is of course necessary to mention the tuning-fork employed.

4. Weber's test retains all the value previously given to it.

5. Rinne's test should be modified in that the base of the fork should be held in front of the otoscopic tube, so that the comparison between air- and bone-conduction be exact.

6. Examination with speech is very important. It is sufficient to test the hearing of vowels and consonants with a whispering voice, excluding the sibilants and using the residual respiratory air after several deep inspirations to obtain a uniform articulation. The letters or words employed should be noted and the distance at which they are heard.

Dr. P. BONNIER recommends the use of a standard acoumetric tuning-fork, with one hundred complete vibrations per second, which is equally suited to test the hearing on contact and by air-conduction. This fork corresponds solely to a decimal unit of time. The ordinary clinical tests show only the relation of ill-defined physiometric quantities. The author proposes to replace them by an exact measure of sensory amplitudes, which can be directly compared from day to day, by measuring daily air- and bone-conduction with the same standards, and comparing one to the other. In Rinne's test, air perception should be measured by applying the foot of the fork on the otoscopic tube. At the London Congress, in 1899, Bonnier described his "pointure acoumétrique"—that is, the equation of air perception and immediate paracousis (mastoid) and distant paracousis (knee) of one and the other side. The optical method of measuring consists of a small mark placed on one of the branches of the fork showing a very fine marking. When the vibrations die out and the eye ceases to see the marking, this is the acoumetric O. The patient ceases to hear the sound (over the tube, the mastoid, or the knee) N seconds before this image disappears; the negative hearing in the first case and the positive in the second would be $-$ N and $+$ N.

A committee, composed of Politzer, Schiffers, and Bonnier, was

selected to present a report on this subject at the next Otological Congress.

Dr. PANZER found the following lesions in **acute otitis media** : The mucous membrane of the tympanum is thickened, the result of a round-celled infiltration, greatest in the superficial layers ; the mucous membrane forms cushions in the anterior part like a finger of a glove. There are exudates and granulations between the ossicles and the walls of the attic. The mucous membrane of the antrum is infiltrated with round cells.

Several communications were made on the important question of **the treatment of chronic purulent otitis.**

HEIMAN (Warsaw) recommends conservative treatment at the beginning, except when indications for surgical intervention are present.

These indications are as follows : In the presence of menacing symptoms of endocranial or general infection, and especially when these symptoms have already begun, operation is absolutely indicated ; likewise in cholesteatoma, caries of the temporal bone where treatment through the canal has been unavailing, in cases of retention of pus where there is a painful infiltration of the mastoid process, or in bony fistulæ, or in congestive abscesses if the patient's condition be good. The mastoid process must be opened, or the Stacke operation performed, according to the extent and situation of the morbid process.

The operation is contra-indicated when the suppuration depends exclusively on a morbid process of the tympanic mucous membrane.

Dr. MIOT lays great weight on the wet dressing in chronic purulent otitis, the dry dressing only being used when the discharge is very much diminished. A prolonged sojourn at the sea-coast is very advantageous. From a surgical aspect he insists upon the advantages of ossiculectomy, which permits treatment of the attic ; the antrum frequently heals without other intervention.

In cholesteatoma, Miot performs the Stacke-Küster method, with the modification of preserving the ossicular chain, if the latter be healthy and it is possible to do so.

Dr. VACHER described a new operative procedure for removing the ossicles and curetting the attic. This is usually performed through the canal, if the latter is large, or else after detaching the auricle and canal. The superior half of the membranous canal is detached and carried outward by two horizontal incisions, the

one anterior, the other posterior, from the depth of the canal and carried down to the bone and out to the auricle. This flap is then detached and withdrawn, so that the upper half of the bony canal is exposed. This opening is sufficient for removal of the ossicles, curettage of the attic after removing the wall of the ossicular chain with Stacke's choroid gouge. The entire upper wall of the canal can be thus removed. This method has given very satisfactory results in the hands of Vacher.

Dr. RUAULT (Nancy) describes two varieties of **paratympanic fistulæ,** caused by a tympanic suppuration which, after extending to the antrum and the mastoid cells, has ceased in the tympanum, but continued in the latter cavities. These openings continue to suppurate either by postero-inferior fistulæ due to opening of the inferior mastoid cells, which may alone be affected when the antrum does not participate or does not exist; these fistulæ are usually situated in the outer part of the bony canal, at a distance from the drum-membrane.

The postero-superior fistulæ, due to necrosis of the lower wall of the antrum or of the upper cells, are situated near the drum-membrane. In this variety healing may take place spontaneously by the same process that we follow in the operation on the middle-ear cavities.

Dr. MOURE calls attention to the fact that the lesion usually described as occurring in a **Bezold's mastoiditis** never occurs alone. It is accompanied by a perforation of the inner table, usually at the level of the sinus, more rarely near the upper part of the antrum, or in the bony auditory canal, and most rarely externally.

When the Bezold mastoiditis is well marked, when there is a purulent collection in the neck, the meninges are bathed in pus and granulations; this is not, however, an absolute rule. The changes occurring in the interior of the mastoid toward the meninges must not be lost sight of. After curetting thoroughly, the wound is closed, except for a drain which abbreviates the treatment generally.

Professor GUYE (Amsterdam) described some anatomical details concerning the **etiology** of Bezold's mastoiditis. With the aid of L. BOLK he examined 420 skulls for persistence of the petro-squamous suture. In one case the suture was found open for three quarters of its length; remnants on both sides were found in 7 cases, on the right only in 4, on left in 3, making a total of 7 in 100.

A specimen of a part of a mastoid process removed during operation of a case of Bezold's mastoiditis was demonstrated. On one side there was an open cell communicating externally by two small vascular orifices, admitting the hairs of a brush, through which the infection had passed to the neck.

Dr. MOLINIÉ has studied the important group of cases of **mastoiditis** which were **not operated upon** with the following conclusions: 1. Acute mastoiditis may be cured definitely with the disappearance of all inflammatory signs, either spontaneously or under the influence of medical treatment. 2. Mastoiditis may heal by spontaneous opening, a very rare event; a fistula remaining is the rule. 3. Mastoiditis discharges through its internal surface the pus descending in the vascular sheath to open spontaneously in the form of a cervical abscess. 4. The spontaneous fistula may subsequently be healed by epidermization of the fistulous tract, by cicatrization or closure of this tract. These are rare terminations and have little influence on the grave prognosis of mastoiditis which has been left to itself or treated medically.

Dr. MÉNIÈRE read a paper on **mastoiditis in children,** and concludes as follows: 1. Mastoiditis following acute purulent otitis is more rare in children (8 in 1103 cases) than in adults (33 in 438 cases). 2. Mastoiditis complicating chronic purulent otitis is frequent (356 in 1748 cases). 3. The mastoid process is formed during the first years by the slow resorption of cancellous bone; the slow, painless, and insidious progress of affections of the mastoid cells may be explained. 4. Caries attacking the cells from without inward without lesions of the tympanum is not rare in young patients (32 cases). 5. The extension of mastoid caries from the interior to the exterior without pain or symptom is frequently observed in predisposed young subjects where the otorrhœa has not been properly treated. 6. Caries followed by necrosis and the formation of sequestra is not very rare among children (34 in 1748 cases). The sequestra are readily cast off, without any neighboring complication in the course of the disease. 7. Complications are rare in children, as extra- or intra-dural abscess, sinus thrombosis, etc. (0 in 2651 acute and chronic cases). 8. Notwithstanding the benignity of the diverse mastoid complications in children, if proper care, methodic cleansing, etc., are without avail, and do not check the progress of the suppuration, recourse must be had to (*a*) removal of the ossicles which are carious and keep up the discharge; (*b*) if this is not sufficient the mastoid should be opened, and, if necessary, combined with

exposure of the middle ear. Such a radical procedure is necessary because experience has shown that mastoid infection occurs insidiously and slowly and does not give any diagnostic symptoms.

Dr. POLI (Gênes) draws attention to the following fact which he has observed in the course of a mastoid empyema. The pus after reaching the sigmoid groove made its way to the surface of the bone without producing severe symptoms in the sigmoid sinus.

Dr. LAURENS reported a **rare complication of aural suppuration.** It was a case of diffuse cranial otitis with thrombophlebitis of the diploic veins in an old woman of sixty-six suffering from an ordinary mastoiditis. At the operation pus was seen coming from mastoid cells, extending into the occipital bone. Canals communicated with these cells, which proved to be diploic channels whose walls, formed by the external and internal tables of the skull, were the seat of an otitis. They contained a vein which terminated in a cul-de-sac or anastomized with others. Each one contained a blood clot or pus. The lesions were so extensive that the external surface of the skull had to be exposed from the frontal to the occipital bones, and from the vertex to the base. All sutures were invaded by the suppurating process. There were no special symptoms, and no evidence of septico-pyæmia in this thrombo-phlebitis limited by the lateral and superior longitudinal sinuses.

The diagnosis and treatment of otitic pyæmia, by DUNDAS GRANT (London).

The diagnosis of otitic pyæmia rests on pyæmic signs in general, combined with an acute or chronic inflammation of the middle ear or surrounding bone. The most important symptoms are repeated chills, sudden and large variations in temperature, metastases in the large or small circulation. It is necessary to eliminate disease with similar symptoms, as typhoid fever, malaria, acute articular rheumatism, infectious endocarditis, acute tuberculosis, and meningitis.

These general symptoms may also depend on brain abscess or meningitis, complications which may exist at the same time with pyæmia. The diagnosis of pyæmia being made, it remains to be confirmed whether this pyæmia is accompanied or not by thrombosis. If the symptoms supervene to an acute otitis and metastases are present in the general circulation, it is probably pyæmia without thrombosis; if they follow a chronic otorrhœa

of at least a year's standing, and are accompanied by pulmonary or pleural metastases, a thrombosis may be presupposed.

The diagnosis is even more probable if the jugular is transformed into a painful cord, hard. A swelling of the orbital contents, with dilatation of the retinal veins, suggests a thrombosis of the cavernous sinus. If the retro-mastoid region is tender, the condyloid or retinal veins are probably invaded. An exact diagnosis can only be made when the sigmoid sinus is exposed; absence of fluctuation between the sigmoid sinus and the internal jugular vein indicates a complete obstruction. A puncture may reveal pus; a negative puncture, a thrombosis; if blood is aspirated, a parietal thrombus may be present.

The diagnosis made, what is the treatment? It is first of all necessary to obliterate the source of infection and all secondary foci; the transportation of septic materials must be prevented, and the general health of the patient kept up.

In acute cases: incision of the drum, opening of the mastoid cells; the metastatic abscesses must be opened as they form. If, notwithstanding, the symptoms persist, the jugular should be ligated, the sigmoid sinus opened and cleansed. The jugular should not be ligated unless the sinus is opened at the same time.

In chronic cases, the radical mastoid operation should be performed, preceded or followed by ligation of the jugular in case of thrombosis. If the thrombosis has become purulent, the sinus must be widely opened until a healthy-looking clot is reached. If the chills should continue, the sinus must be still farther exposed until bleeding is established from both ends.

In thrombosis of the jugular vein, the ligature must be applied as low down as possible, the vein divided and the upper end brought out at the upper end of the wound, and the contents evacuated by a curette or syringe. If the vein is not thrombosed, the ligation is made high up and the trunk not divided. Any involuntary wounding of the sinus should be avoided, as severe symptoms may follow.

Every tampon placed in the sinus must be removed as soon as possible, even at the end of twenty-four hours.

When the pyæmia seems complicated with meningitis, lumbar puncture should be made. If the liquid contains pus corpuscles, all operations are useless; but if a serous meningitis seems to be present, the indication for operation is more pronounced.

A complicating brain abscess must be evacuated by an opening in the skull as far distant as possible from the affected sinus.

The mastoid vein may alone be thrombosed. Dr. Laurens has reported an example of this rare condition occurring in the course of an old otorrhœa. Pain and swelling were present back of the mastoid, with general pyæmic symptoms. Abscess of the back of the neck frequently follows. The mastoid should be opened, the vein and sinus exposed, the jugular ligated, and the infectious focus destroyed.

Dr. ZAALBERG (Amsterdam) reported a curious case of **otitic pyæmia** without thrombosis of the lateral sinus, terminating in recovery.

Drs. STANCULÉANU and BAUP described several cases of **aural infection** with or without **thrombo-phlebitis.** In the first group, there was a case of septicæmia with hypothermia due to the colon bacillus ; in the second group, cases of fatal septicæmia due to streptococcus. They observed, following benign otitis media, a case of infectious pseudo-rheumatism and one of mental confusion.

Dr. COLLORIET (Paris) concluded from two observations that in cases of meningitis of aural origin one must intervene to endeavor to remove the source of infection. The dura mater, however, must not be attacked unless the extent of the lesions or phenomena of cerebral localization warrant it. Urgent intervention is indicated in brain abscess even with symptoms not more definite than nausea, headache, localized pain, and though the general condition be good.

Surgical treatment of otitic sclerosis. Prof. SIEBENMANN (Bâle) came to the following conclusions : Intervention can only be of value in cases with changes due to a suppurative otitis or in catarrh of the hypertrophic form, though the results in the latter are uncertain. The juvenile form of progressive deafness begins usually between the ages of ten to twenty or twenty to thirty. The lesions consist in the formation of one or more cancellous foci in the osseous substance of the labyrinth capsule. One of the first changes is the fixation of the stapes by a process of ossification which advances forward and inward to the extremity of the cochlear canal. Isolated foci may be present in the spiral lamina and produce the signs of nervous deafness either by physical or chemical changes in the lymph or perilymph, or by compressing the cochlear nerve. To treat these cancellous foci

in the labyrinthine capsule surgically, it would be necessary at the beginning to remove so much of the diseased bone that a large part of the cochlea is opened and destroyed.

Dr. RICARD BOTEY (Barcelona) arrived at similar conclusions. To justify operation, cranial perception of the watch must be preserved. Rinne must be negative on the affected side and perforation of the drum improve hearing. The author condemns all operations on the ossicles as without permanent results. Owing to the anatomical changes in sclerosis, surgical treatment must be of dubious value. Dr. Miot shares these views only in cases of panotitis. In the deafness from muscular insufficiency of the muscles of the middle ear and Eustachian tube, the mobilization of the ossicles or their extraction gives good results.

Dr. MALHERBE (Paris) has more advanced views on this subject and regards the surgical treatment of sclerosis with favor, basing his opinion on sixty cases of dry otitis media treated by the petro-mastoid operation.

In forty-one cases the sclerosis was secondary to catarrhal tubo-tympanitis or to middle-ear suppuration ; the corresponding results were always very good.

In nineteen other cases the sclerosis was primary. The results varied with degree of involvement of the labyrinth. In two cases they were good, in six moderate, in five poor. These last five cases presented an advanced degree of labyrinthine sclerosis ; the improvement after operation increased for some time, then it remained stationary. In these cases five had been operated on in both ears ; the results were as successful on one as on the other side. The second operation may be done as soon as the patient has completely recovered from the first.

The author has a new grouping of the dry catarrhs in two groups: 1st. Interstitial hypertrophic tubo-tympanitis subsequent to catarrhal lesions propagated by the tube. 2d. Atrophic sclerosed antro-tympanitis where the malady begins in the middle ear and tympanum and changes immediately to sclerosis. He further speaks of rhino-salpingitis, pharyngo-salpingitis, and a combined form. In the large group of primary sclerosis he describes a congenital type of early and rapid sclerosis in young women and calls it precocious adhesive tympanitis.

The extreme views of Malherbe are not shared by other French otologists, whose opinion is voiced as follows by Dr. LAURENS :

I have never operated on cases of sclerosis, because the cases so

treated by Dr. Malherbe which I have seen seemed to have derived no benefit from the operation, and in one the operation was followed by vertigo, which had not existed before, and in another otorrhœa set in. The subjective noises not connected with the sclerosis are capable of improvement; those, however, which are dependent on this affection are often rebellious. Drs. Cuvillier and Vassal have had good results with revulsive methods practised on the mastoid process, tincture of iodine, frictions, vesicants, and the actual cautery. Bromide and iodide of potassium combined remain the most valuable remedial agents.

Dr. Suarez de Mendoza considers long-continued massage of the tympanum as susceptible of relieving the noises in sclerosis.

Cause and treatment of Ménière's disease by Dr. MOLL (Arnheim). Ménière's disease, or Ménière's syndrome, consists of vertigo, tinnitus, partial or complete deafness, with nausea or vomiting. Aural vertigo is to-day well known; it arises from an affection, transient or permanent, of the labyrinth; primary if there is an intralabyrinthine lesion, secondary if there is only an increase of intralabyrinthine pressure, an abnormal compression following lesions of the middle or external ear. As Ménière's disease presents itself in various forms, as it has not always the same origin, and as the symptoms are exactly the same when an affection of the other parts of the ear is present, it seems needless to retain the expression Ménière's disease for a single form. This symptom-syndrome may depend on a lesion of the external ear, of the middle or the internal ear, of the acoustic nerve.

Treatment varies with the cause. To quiet the labyrinthine hyperæsthesia, the sulphate of quinine is the favorite remedy, given in small doses; the hypodermic injection of pilocarpine (Politzer, Lucae); in case of syphilis the iodides; the bromides in the neurasthenics. The reflex trouble due to nasal or pharyngeal lesions must be considered and the latter treated.

Ménière's syndrome is an important symptom of toxic labyrinthitis, which disappears frequently completely when the cause ceases.

Dr. BAR (Nice) drew attention to the **tricophytosis** of the **external auditory canal** which gives a good prognosis.

Dr. GROSSARD (Paris) reports a very unusual case of **double repeating auricular hemorrhages** in a woman of sixty-three years with disturbed hearing.

Dr. JACQUES demonstrated some specimens, showing the **nervous terminations in the drum.**

Professor URBANTSCHITSCH (Vienna) examined deafness to determine if any hearing remained, and found that total deafness is very rare. The **methodical hearing exercises** have the effect of: (1) awakening the attention for acoustic impressions; (2) the distinguishing by the hearing the meaning of what they hear; (3) the gradual increase of acoustic sensibility.

Dr. SCHWENDT (Bâle) came to the same conclusions and added that this complementary education by the ear should not be carried on in neglect of lip-reading. To obtain the best results, the half deaf must be separated from the other deaf-mutes.

Drs. MARICHELLE and DUFO DE GERMANE prefer the voice for the exercises and the phonograph for repeater. Dr. Gellé uses the micro-phonograph.

Dr. MADER (Munich) showed an instrument, the otomicrophone, to study the transmission of sound in the ear.

Dr. MAHN (Paris) demonstrated a very ingenious dilating speculum for the examination of the ear in cases of accidental stenosis of the canal.

REPORT OF THE MEETING OF THE NEW YORK OTOLOGICAL SOCIETY OF MARCH 27, 1900.

By Dr. H. A. ALDERTON, Secretary.

PRESIDENT, DR. C. J. KIPP, IN THE CHAIR.

Dr. Max Toeplitz reported a case of **intermittent high temperature,** occurring about every other day three or four times; once so high as 106° F. The child had a swollen pharynx with a whitish spot upon the right tonsil. The child had suffered until January, 1900, from otorrhœa, which had left a perforation of the right membrana tympani. The consulted pædiatrist could not account for the high fever by the appearance of the throat, which did not look diphtheritic; he tried to blame the ear for it (probably retention of pus in the middle ear or mastoid). T. found the ear free from acute trouble and made cultures from the throat which proved to be pure cultures of staphylococcus pyogenes aureus. The temperature subsided spontaneously. T. thought that these infections of the throat with cocci deserved further study.

Discussion.—Dr. Dench asked if staphylococci could produce such temperature? Dr. H. Knapp thought they could. Since Wunderlich, the originator of clinical thermometry, acute pharyngitis, especially in children, has been noted for its inordinate fever.

Dr. J. F. McKernon reported further upon a case, formerly reported at a meeting in 1899, where he could not relieve **distressing tinnitus.** This case was cured by bougieing the Eustachian tube of the affected side, using the negative pole of a galvanic current by means of a gold bougie. The strength of the current was 30 volts, 3½ milliamp., contact 2½ minutes. The bougie was passed well into the tympanum and allowed to remain there for the above time. The tube was not strictured

throughout any part. Recovery was immediate and has remained so up to the present time. The electrolysis no doubt acted upon the middle-ear deposit, causing its absorption.

Discussion.—Dr. J. L. ADAMS asked if Dr. McKernon had ever had any inflammatory results following the application? MCKERNON had had two cases of acute inflammation, healing in ten days or less. DENCH thought all these cases should be examined with forks of 16 v. s. to establish accurate lower-tone limit.

Dr. MCKERNON reported a case of **recurrent mastoiditis** in a boy, nine years old, operated on in June, 1899, for mastoiditis: the usual operation, pus in the antrum, healed in about seven weeks with good hearing. In March, 1900, he received a blow on the side of the head just above the auricle. He was dizzy for five days, then complained of pain over and around region and side of head. Two weeks after the blow, was seen at clinic, and the scar in old wound was found bulging and discharging at the lower angle of the scar. He was again operated upon, and softened bone found all over inner table, with an extensive collection (epidural) of pus over both middle and posterior fossæ. The sinus was exposed for over an inch but was not affected. The wound healed slowly. It would seem hardly possible for the extensive re-involvement to occur in such a short period as that between the time of the blow and the second operation. There had been no complaint of headaches previously.

Discussion.—Dr. DENCH thought that the focus of pus was in the skull at the first operation and was reinfected as a result of the blow.

Dr. E. B. DENCH reported a case of **sinus thrombosis and cerebellar abscess** (full report of case in the last volume of the Transactions of the American Otological Society).

Dr. DENCH reported a case of **Bezold's mastoiditis, sinus thrombosis, and necrotic jugular vein.** The patient made a perfect recovery. The interesting point in connection with this case was, that owing to the necrotic condition of the vein, it was impossible to excise it. D., therefore, divided the vein between two ligatures, just below the jugular bulb, and again just above the clavicle. All tributary branches were also divided between two ligatures. The septic focus was, in this manner, completely isolated, but, as it was impossible to remove it, it was left in situ, being separated from the surrounding

structures by iodoform gauze. The wound was left open throughout its entire length.

Discussion.—Dr. J. L. ADAMS inquired if the infiltration of the neck was secondary to the phlebitis? Dr. DENCH: Yes.

Dr. F. WHITING reported a case **of sinus thrombosis.**

Dr. F. M. WILSON reported a case of **fugitive facial paralysis.** A young woman, after sitting by an open window, had, the next day, a slight facial paralysis of the left side. She also had enough pain and deafness in the left ear to make her quite uncomfortable. The left membrane was slightly red and the hearing reduced to $\frac{1}{4}\frac{8}{0}$. Rest at home was the principal treatment and there was complete recovery in ten days. Dr. W. stated that cases of so-called fugitive facial paralysis are comparatively common, but aurists see very few of them because usually there are no aural symptoms. The accepted pathology of these cases is a neuritis in the Fallopian canal, caused by cold. It seems very strange that cold can cause neuritis in the Fallopian canal without, at the same time, causing other symptoms of mild tympanic inflammation.

Discussion.—Dr. DENCH thought the trouble in this case might have been due to a dehiscence in the wall of the Fallopian canal. They all recover. He had reported one case which had facial paralysis upon both sides, one side following the other, as a result of a mild otitis media purulenta acuta. Dr. H. KNAPP said that he had seen similar cases with almost no physical signs, except congestion of the drum-membrane. They were, however, duly described in otological periodicals, and but lately he had read an article in a French otological journal.

Present.—Drs. C. J. Kipp, H. Knapp, E. B. Dench, J. F. McKernon, M. Toeplitz, J. L. Adams, F. M. Wilson, A. Duane, F. Whiting. Dr. F. Whiting acted as secretary *pro tem.*

REPORT OF MEETING OF MAY 22, 1900.

Dr. E. GRUENING presented a patient. **A case of operation for perisinuous abscess, sinus thrombosis, and ligation of the jugular.** The patient had a **cerebral hernia** presenting through the operation wound.

Discussion.—Dr. H. KNAPP remarked that general surgeons commonly advised abscision. He had had a similar case with a very large hernia, and kept it aseptic by applications of boric acid

powder and aseptic gauze. There was no granulation tissue, but a second abscess. Gradually the hernia shrunk after evacuation of the second abscess and disappeared, leaving no trace in outward appearance or function. Dr. C. J. KIPP asked as to how the hernia happened to occur in Dr. Gruening's case. Dr. GRUENING answered that there was no trace of hernia when the patient left the hospital. It had appeared since, pushing forward the scar tissue. Apparently there was very little brain tissue present in the hernia. Dr. T. P. BERENS: Was there any breaking through of the dura at the operation? Dr. GRUENING: Apparently not. Dr. KIPP: Any fluid? Dr. GRUENING: No. Where the hernia has been abscised, there has occurred infection, and the patient has died in every case in which he has seen the surgeons do this. He had not been able to find any literature of a similar case of hernia following a simple mastoid operation. The mass came through the roof of the antrum. Dr. BACON asked whether Dr. G. would think well of the use of an elastic ligature. Dr. GRUENING: Yes. Dr. BACON asked if the bone was especially softened around the sinus. Dr. GRUENING answered no, that the bone was eburnated.

Dr. GORHAM BACON reported a case of **pre-auricular subperiosteal abscess following O.M.P.A., ending fatally.**

Boy, private patient, eight years old, with history of tuberculosis. Had an attack of tonsillitis several days before Dr. B. was called in to see him. B. first saw him in consultation April 21, 1900, and at that time he had some temperature with grippe symptoms and some pain in the left ear. He also complained of photophobia. On April 22d B. incised freely both drumheads, under nitrous oxide gas, as they were bulging. Patient seemed better after this, and B. was not called again till April 28th. At that time the **left** auricle was standing out from the head. Fluctuation detected above and in front of the auricle. The boy was anæsthetized and the abscess freely opened—also the antrum and mastoid cells. The mastoid was of the diploic variety and contained softened bone, granulations, and but little pus. This operation was performed on April 29th. Before the operation he complained of considerable pain over the eyes. This pain was relieved by the operation and for several days he seemed much better and was doing well. May 8th he was worse again—severe headache (frontal)—and very irritable. May 11th, B. opened **right** mastoid antrum and cells, as there was tenderness on press-

ure in this region. Same condition of bone found on this side. Some granulation tissue and a little pus. May 13th.—Boy again much better, and apparently all symptoms relieved by the operation. He seemed very happy and comfortable. May 15th.—Not so well. He began to complain of headache over his eyes; inclined to draw his head backwards, irritable, passes urine involuntarily at night. Temperature normal, pulse 120. May 16th.—Vomiting, irritable, drowsy; when aroused, pupils widely dilated and patient very much excited and with a terrified expression. Has been crying out all night; pulse slower, also respiration; at 7 P.M. he died suddenly, respiratory centre being paralyzed—pulse continued some time after respiration ceased. The temperature was practically normal throughout the disease after the first operation. No paralysis, no symptoms, except the headache, rapid pulse, and finally symptoms of meningitis.

Discussion.—Dr. A. H. KNAPP asked whether the nose had been examined. Dr. BACON said no. Dr. HEPBURN asked whether there had been any afternoon rises in temperature. Dr. BACON: No. Dr. HEPBURN thought that that would rather be against tubercular infection. There should be a P.M. temperature, even though slight.

Dr. R. LEWIS reported a **case of mastoiditis** following syringing for antrum-of-Highmore empyema.

Discussion.—Dr. GRUENING asked whether the auricles were swollen in this case. Dr. LEWIS said: Not at the time of the operation, but since. Dr. GRUENING had recently seen a similar case of simple mastoiditis, followed by swelling of the auricle. This is almost pathognomonic of erysipelas from mastoid operation. Dr. BACON had a case in which, in a simple mastoid case, white erysipelas occurred and the auricle was not involved. Dr. ALDERTON had recently had a case of sinus thrombosis, operated upon with ligation of the jugular, in which erysipelas occurred on the fourth day after operation, interfering but temporarily with the progress of recovery. Dr. TOEPLITZ had had a case complaining of tinnitus in right ear. There was a serous secretion. On the third and fourth days, chills. The mastoid was not involved. Erysipelas set in. On the fifth day the patient died. The culture showed staphylococcus pyogenes albus. No streptococcus. Patient had also diabetes and kidney trouble. Dr. BERENS had seen two cases of erysipelas following mastoid operation. In neither were the auricles involved. Dr. QUINLAN spoke of a case of erysipelas

occurring during an attack of Bezold's mastoiditis. Dr. KIPP operated upon a case in which erysipelas was present at the time of operation. The patient had head symptoms, making the operation necessary. Patient recovered, as have all the cases of erysipelas he had seen, but one.

Dr. LEWIS reported a **case of stenosis of the external auditory meatus,** operated upon with healing in thirty-one days.

Dr. ARNOLD KNAPP reported a case of **otitis interna** in a man forty-one years of age who had suffered from exophthalmic goitre for six years. The right ear had long been totally deaf, with a history of suppurative otitis after scarlet fever. On April 23, 1900, patient noticed that the voices about him grew fainter and he was seized with vertigo, tinnitus, and vomiting. The loss of hearing became total and the tinnitus was constant and very annoying. When seen two hours later he was very much excited, face cyanotic, pulse 140, and it was impossible to make him hear anything. Hot bath, salicylate of soda, and rest in bed were prescribed. On the following day the left *Mt* was examined and found somewhat retracted, Eustachian tubes free; no perception of sound, no bone-conduction, no high tones. Owing to the tachycardia and cyanosis, though the heart sounds seemed normal it was thought best not to administer pilocarpine. The salicylate of soda was continued; later calomel and then iodide of potassium were given; the Eustachian tubes were catheterized daily. April 25th, tinnitus and cyanosis less. Hears loudest voice at 6 inches from ear; urine was found normal. April 26th, condition better. C fork heard by air but not by bone. c^5 negative. April 28th, loud voice at 1 foot; $H = \frac{1}{60}'$. C fork now heard by bone-conduction but very much shortened. c^5 perceived, Galton negative. May 4th $H = \frac{2}{60}'$. Rinne negative; bone-conduction shortened. Galton 6 perceived. Low forks heard. Some tinnitus.

May 10th $V = \frac{3}{60}'$. Galton 6. Lower limit F. The patient has since continued to improve though it has not been possible to examine him again.

This case is of interest as being one of sudden total deafness in a patient suffering from exophthalmic goitre. The rapidity of improvement makes it likely to have been a circulatory disturbance of the labyrinth. The order of regaining the hearing-power could be well studied as the other ear was totally deaf.

Discussion.—Dr. BACON asked whether there was any kidney

complication. Dr. A. KNAPP answered that the urine was normal. Dr. KIPP asked whether Dr. K. was able entirely to exclude the hearing from the other side. Dr. A. KNAPP said he thought so. Dr. BERENS asked whether syphilis was present. Dr. A. KNAPP said he had not inquired. It was not feasible.

Dr. F. J. QUINLAN reported a **case of facial paralysis ascribed to gout.**

Young man, thirty-four years of age, awoke one morning and found his face paralyzed, with the symptoms of open eye, escape of liquids at meal times, some tenderness over mastoid tip, increased over region of antrum and middle plate; hearing slightly impaired, but well-marked tinnitus. No history of syphilis; patient has always been in excellent health up to present illness. A provisional diagnosis of gouty neuritis was made. Calomel in small quantities was administered; but baths and abstinence from meat, enforced by long walks and active vigorous exercise, enjoined. Within three weeks paralysis had entirely disappeared and the patient's face showed very little evidence of recent striking condition.

Present.—Drs. C. J. Kipp, A. Duane, E. Gruening, G. Bacon, H. Knapp, R. Lewis, A. Knapp, F. J. Quinlan, J. E. Sheppard, T. P. Berens, N. J. Hepburn, J. B. Clemens, C. H. May, M. Toeplitz, H. A. Alderton.

REPORT ON THE PROGRESS IN OTOLOGY DURING THE FIRST QUARTER OF 1900.

(Concluded from page 342.)

By Dr. ARTHUR HARTMANN.

Translated by Dr. Arnold Knapp.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

44. Jürgens, G. The purulent processes of the ear, their causes and clinical varieties. *Monatschr. f. Ohrenheilk.*, No. 2, 1900, and *Wojenno-medicinski Shurnal*, Dec., 1899.

45. Nadoleczny. Bacteriological and clinical examinations of genuine acute exudative otitis. *Arch. f. Ohrenheilk.*, vol. xlviii., p. 206.

46. Faraci. Early mobilization of the ossicular chain in the subacute period of several non-suppurative middle-ear inflammations. *Arch. ital. di Otologia*, etc., vol. ix., p. 137.

47. Faraci. Acoustic and functional importance of the mobilization of the stapes. Result of a new series of operations. *Arch. ital. di Otologia*, etc., vol. ix., p. 209.

48. Weiss. The etiology and pathology of otitis media in sucklings. *Beiträge zur pathol. Anatomie und zur allgemeinen Pathologie*, vol. xxvii.

49. Schemgelidse. Purulent otitis media in sucklings. *Dissertation*, St. Petersburg.

50. Jarowizki. The Bezold form of mastoiditis, caries of the petrous, mastoid, and occipital bones; abscess of the neck. *Wojenno-medicinski Shurnal*, Dec., 1899.

51. Pomroy, E. H. Otitis media in all grave diseases of infancy. *Boston Medical and Surgical Journal*, Jan. 18, 1900.

52. McCaw, James W. Mastoiditis: Importance of early treatment. *New York Medical Journal*, Dec. 30, 1899.

44. JÜRGENS considers the presence of streptococci in the pus of an acute or chronic otitis to be unfavorable and to form an indication for opening the mastoid. In a series of cases pure culture of the streptococcus was associated with a remittent and continuous fever with well-marked signs of the septicemia, while in mixed infections of the streptococcus, short and long, with staphylococcus, the course was less violent with less severe symptoms and comparatively low temperature. Streptococcus brevis produces periodically violent outbreaks, alternating with quiet periods where the local and general symptoms do not present a characteristic clinical picture. Streptococci only could be found in the diseased bone. KILLIAN.

45. NADOLECZNY examined 34 cases carefully for bacteria. The pneumococcus was found pure in 7, streptococcus in 6, staphylococcus aureus in 2, albus in 3; in the others combinations of diplococci and streptococci with staphylococci were present. Early paracentesis is recommended. The disease may become chronic independent of the bacterial infection. According to the author the exudate in the tympanum acts antibacterially, and may lead to cure without perforation. BLOCH.

46. FARACI finds that there are two kinds of acute middle-ear inflammation, with mild symptoms and marked disturbance of hearing, and with severe symptoms and slight loss of hearing. Operative intervention is proper in the first variety, where the sound-conducting apparatus is affected. A flap with base down is made in the upper and posterior quadrant of the drum, exposing the incudo-stapedial joint. The exudate is removed with a small forceps which is prolonged in the niche of the oval window, and all adhesions are freed. If hearing is not improved, the flap is enlarged and the round window is cleansed. GRADENIGO.

47. FARACI reports on 20 new cases of mobilization of the stapes. The results are always good if the perceiving apparatus is in good condition. The results are best in the chronic purulent otitides, good in the residua, moderate in the dry inflammations. Vertigo disappears, but the subjective noises are rarely changed. Complications or unpleasant symptoms did not occur.

GRADENIGO.

48. WEISS examined 28 cases bacteriologically and histologically. The cases were sucklings usually in the condition of pædatrophy. The temporal bones were removed very soon after death. The drum was perforated with the red-hot platinum wire,

and material for the bacteriological examination was thus obtained. The temporal bone was then fixed and decalcified. The tympanum presented a well-developed lumen with contents according to the character of the mucous-membrane affection. 1. with serous contents and but slightly swollen mucous membrane; 2. ropy, cloudy contents, the mucous membrane is changed to a kind of granulation tissue; 3. purulent exudate and evenly swollen, dark-red mucous membrane. The embryonal type of the mucous membrane is still recognizable in the second half of the suckling's age. This may explain etiologically the great frequency of middle-ear disease in suckling's age and its quite peculiar type.

Without any experience in the living, the author thinks the otitis media of sucklings has no influence on the general organism.

HARTMANN.

49. SCHEMGELIDSE investigated, 1. the frequency of purulent otitis media in sucklings; 2. the bacteriology of the middle ear; 3. the anatomical peculiarities of the tympanum and Eustachian tube of sucklings, and 4. the pathogenesis of the disease. Ninety bodies were examined, of which 46 middle ears belonging to 35 bodies were examined bacteriologically and histologically, while the remaining 55 bodies served for anatomical examination. Purulent otitis media was present in 48 (75 %) of 68 cases, and usually bilateral. In 44 (91.6 %) pneumonia was associated, and in 34 (70.8 %) gastro-intestinal catarrh. Not a single middle ear was found aseptic in the bodies of sucklings; in older children (up to the seventh year) bacteria were absent 7 times. The bacteria found were: Fränkel's diplococcus, 19 times; staphylococcus albus, 12; aureus, 5; streptococcus, 8; bacillus pyocyaneus, 3; Friedländer's diplococcus, sarcina and saccharomyces, once. Streptococci were found in the severe cases of purulent otitis; when Fränkel's diplococcus was present, mucus, epithelium, and a few pus cells were found in the tympanum.

The relative position of the pharyngeal mouth of the tube was noted in relation to the posterior end of the hard palate and the base of the skull, the breadth of the latter, the angle formed by the tubal axis and the inferior meatus, the length and breadth of the tube. These measurements were made in 80 bodies. The location of the pharyngeal ostium varied with the age; the distance from the above named structures increases. The pharyngeal ostium projects but slightly in sucklings. The line of the

tube is nearly horizontal. The length increases with the age, and the angle made with the inferior meatus becomes smaller. The tympanic epithelium is the same throughout life, but the connective-tissue fibres are nearly wanting in the subepithelial tissue. As regards air-pressure variations in the tympanum during nasal breathing, no change takes place, in mouth-breathing it varies 3–4 *mm*, in crying, 4.5 *mm*, in coughing, 6 *mm*. Inoculation of the mucus from the pharyngeal ostium of the tube and from the middle ear shows a much weaker reaction on the part of the latter, and the author believes that in the tympanum attenuation takes place.

SACHER.

50. Report of case successfully operated upon. SACHER.

51. After reviewing the statistics of Ponfick, of Breslau, POMROY reiterates the importance of repeated and careful examinations of children's ears in nearly all diseases. The origin of infection of the diseases of childhood is more easily demonstrated than in adults; the post-nasal space is the comprehensible distributing point for infection to the middle ear, the brain, the lungs, the stomach, and the intestines. The middle ear, acting as an incubator and generator, promotes toxic symptoms in localized infective diseases.

Ponfick made one hundred autopsies upon infants dying of various acute and chronic diseases, and although otitis media was not suspected in the majority of the cases it was present in all but nine of them.

The difficulties encountered in examining children's ears are many. Nothing but long practice will suffice to give a definite idea of the appearances of the tympanic membrane in health or disease, but the practice should be persisted in. Paracentesis of the membrana tympani should be preceded by thorough cleansing of the ear with sublimate solution, and ether or chloroform anæsthesia induced for a thorough examination. J. B. CLEMENS.

52. MCCAW discusses the importance of and the necessity for proper treatment of mastoiditis, and draws the following conclusions: 1st. In threatened mastoid involvement, and in the mild acute cases, the conservative plan of treatment should be first tried for a week or ten days, unless dangerous symptoms arise. 2d. Operative interference should be instituted in acute cases where there is sagging of the postero-superior canal wall, when the infection is of a virulent nature, and in all cases complicating chronic otorrhœa. J. B. CLEMENS.

b.—CHRONIC PURULENT OTITIS.

53. KOTSCHINEW. Treatment of chronic otorrhœa with sterilized and boiled water. *Wojenno-medicinski Shurnal*, January, 1900.

54. MÉNIÈRE. Treatment of chronic suppurations of the attic. *Arch. internat. de laryngolog., d'otologie*, etc., vol. xii., No. 5.

55. GARBINI and BALISTRERI. Contribution to the study of the middle ear. *Arch. ital. di Otolog.*, vol. ix., p. 181.

56. CASTEX. Operative facial paralysis. *Bulletin de laryngol., d'otologie*, etc., Dec. 30, 1899.

57. TISSOT. Large cholesteatoma of the temporal bone following a double chronic purulent otitis. *Arch. intern. de laryng., d'otologie*, vol. xii., No. 5.

58. JAKINS, PERCY. Eighty successive cases of Stacke's operation. *The Lancet*, Feb. 10, 1900.

59. BALLANCE, CHARLES A. "The conduct of the mastoid operation for the cure of chronic purulent otorrhœa, with special reference to the immediate healing of the cavity in the bone left by the operation, by means of epithelial grafts." *The Lancet*, Jan. 27, 1900.

53. Report of 200 cases. Fifty patients were treated dry; 25 with aristol, and 25 with boric acid. Two of these died of thrombosis. Otorrhœa ceased usually after 70 days. Of the 150 treated with syringing, none died. Syringing with distilled water gave very good results in 50 cases, the otorrhœa ceased after 3 weeks, after syringing with 2–10 % boric acid (30 cases) or salt solution (25 cases) not before 60 days. Boiled water acted as well as distilled. SACHER.

54. MÉNIÈRE has injected "ipsylène iodoformé" in the attic by means of Hartmann's canula with satisfactory results.

55. GARBINI and BALISTRERI examined the secretion of chronic purulent otitis for tuberculosis. Cultures and inoculations were made with polypoid vegetations. Four out of forty examinations proved positive. The authors draw the conclusion that tubercular caries occurs in 10 % of the cases of caries.

GRADENIGO.

56. Facial paralysis after operation may have several causes. 1. Direct traumatism from cutting instrument or bone splinter.

2. Injury by traction on the chorda tympani. 3. Commotion. 4. Pressure on nerve by blood effusion in middle ear or produced by collection of pus in the Fallopian canal, or by ostitis of the walls. 5. Degeneration of the nerve after operation on the middle ear.

Prognosis is good. Treatment according to cause. Electricity, exposure of facial canal. LEDRY.

57. After ten years' duration of a chronic suppurative otitis with several abscesses about the mastoid TISSOT performed the radical operation. The antrum was filled with cholesteatomatous masses. The squama was invaded with cholesteatomatous masses and appeared distended. The cavity was as large as that described by Lubet-Barbon. Above the place of election the squama was defective and granulating dura appeared.

According to the author cholesteatomatous complications are more frequent since the influenza appeared. Strange to say, no signs of brain pressure were present in this case.

SCHWENDT.

58. An interesting tabular statement with remarks and some deductions. The operation as described by JAKINS is not Stacke's operation. ARTHUR CHEATLE.

59. This highly important paper was read at the Royal Medico-Chirurgical Society, on January 23, 1900. BALLANCE operated in two stages:

1. The operation for the removal of the disease.
2. The operation for the healing of the wound.

The first is the usual complete post-aural operation which has been for some time in vogue among aural surgeons. Special attention is drawn to the necessity for thoroughly cleaning the fossa under the Fallopian Aqueduct (Sinus Tympani of Steinbrügge).

The meatus is dealt with in a novel manner; the skin incision is made along the line of the hair and the flap turned forward with the auricle. After the bone operation is completed, a long narrow knife is passed down the meatus, the inferior wall of the canal is divided vertically well into the concha, the cut being carried with a curve upwards and backwards till it reaches the level of the anterior commencement of the helix. The posterior wall of the meatus is then pushed upwards and backwards, and attached by several silkworm-gut stitches to the skin flap, raw surface to raw surface. Before putting in these stitches, the thick layer of tissue behind the posterior wall of the meatus is cut away, in order to

facilitate the application of the meatal to the skin flap. The ragged edge of the membranous meatus is previously trimmed with scissors. The skin-incision is then sutured and the ear packed with gauze through the enlarged meatus. The second operation is undertaken, under favorable circumstances, in children at the end of the week ; in adults at the end of ten days, two weeks, or three weeks. The original incision is opened up and the flap and auricle again turned forwards. After thorough drying, the cavity is lined entirely by a large skin graft taken from the patient's arm or thigh. Care is taken that the graft covers the irregularities of the cavity accurately. As a protection to the graft pure gold leaf about $\frac{1}{16000}$ to $\frac{1}{20000}$ of an inch in thickness is accurately applied over it and the skin flap resutured. A week later the plug is removed and the gold leaf a few days later.

Mr. Ballance showed several cases in which the result was excellent. He also gave abstracts of the notes of all cases in which the grafting had been performed. This important paper should be carefully studied, as it is impossible to give in an abstract even the essential points. ARTHUR CHEATLE.

c.—CEREBRAL COMPLICATIONS.

60. RÖPKE. Report of cases illustrating the difficulty of diagnosis in endocranial otological disease. *München. med. Wochenschr.*, No. 10, 1900.

61. WARNECKE. Two cases of sinus thrombosis with fibrous obliteration of the sigmoid sinus. *Arch. f. Ohrenhlk.*, vol. xlviii., p. 169.

62. WARNECKE. A case of fetid chronic purulent otitis with cholesteatoma complicated with a tuberculoma of the cerebellum and tubercular meningitis. *Arch. f. Ohrenhlk.*, vol. xlviii., p. 202.

63. KUNEBERG. The operation for pyæmia of otitic origin. *Wojenno medicinski Shurnal*, Nov., 1900.

64. COLLINS, BURNETT C. A case of mastoiditis ; cerebral tubercle ; death ; autopsy. *Laryngoscope*, Jan., 1900.

65. RICHARDSON, C. W. Septic thrombosis of the sigmoid sinus. *Virginia Med. Semi-Monthly*, Jan. 26, 1900.

66. HEATON, G. Infective thrombosis of lateral sinus. Cure without ligature of the internal jugular vein. *Brit. Med. Jour.*, Feb. 24, 1900.

67. CHEATLE, ARTHUR. A case of thrombosis of the lateral sinus secondary to chronic middle-ear suppuration, in which the internal jugular was not ligatured; recovery. *The Lancet*, Jan. 13, 1900.

68. LEDERMAN, M. D. Extensive thrombosis of the lateral sinus and internal jugular vein, following acute suppurative otitis media. Ligation of the internal jugular vein in its lower portion. *N. Y. Med. Jour.*, March 17, 1900.

60. I. Chronic otitis purulenta with cholesteatoma. Pain in occiput, convulsions in extremities of same side, attacks of unconsciousness, rigidity of neck, bilateral choked disc, fever, slow pulse. Sinus was found normal at operation. Incision of cerebellum and temporal lobe evacuated only normal cerebro-spinal fluid, which appeared not to be under unusually high pressure. Hearing distance for whisper 2 metres. Recovery.

II. Chronic otitis purulenta with fistula. Pain in ear, vertigo, vomiting, attacks of unconsciousness, convulsions, facial paralysis, slow pulse, Cheyne-Stokes respiration, pain in occiput, deafness for whisper. Incision of cerebellum. Cerebro-spinal fluid not increased. No fever until after operation. Recovery.

The nature of these cases was not cleared up at operation. A case of necrosis of the labyrinth is reported, which ended fatally after curetting the labyrinth. SCHEIBE.

61. Two cases of chronic discharge from the ear; the second combined with cholesteatoma. The pyæmic symptoms had disappeared without producing any serious trouble. BLOCH.

63. A soldier, twenty-five years of age, developed acute mastoiditis in the course of chronic purulent otitis. Prompt opening and cleaning out of the mastoid (the sinus was not exposed) had no effect on the course of the disease. The fever became pyæmic in type and a purulent gonitis set in. Disease of the transverse sinus was therefore suspected. The internal jugular was ligated, the sinus exposed and punctured. No thrombus was found and the sinus was not further opened. The fever remained pyæmic, purulent metastases appeared in the shoulder-joint, in the leg, and buttocks. Notwithstanding, recovery finally took place. Whether this was a case of parietal or disintegrated thrombus, or thrombosis in some other locality, or pyæmia without sinus involvement, could not be determined. SACHER.

64. Eight weeks after a mastoid operation on a previously healthy child, the patient developed symptoms referable to intra-

cranial complication. Although the cranial cavity was carefully opened and searched, no pus was found. The autopsy showed the brain to be softened and an excess of cerebral fluid. Tubercles were found in abundance in the temporo-sphenoidal lobe, in the meshes of the pia, and in the lungs, liver, and spleen. The mesenteric glands were enlarged. Cerebral sinuses were found to be normal. J. B. CLEMENS.

65. The patient was a man sixty years of age, who for many years had suppuration of the right ear. Symptoms of septic infection developed with vertigo and tenderness over the mastoid. The jugular region appeared normal though there was tenderness on pressure. Slight pressure over the point of exit of the mastoid vein caused severe pain. Examination of the ear showed complete destruction of the membrana tympani and of the ossicles. The usual mastoid operation was performed and the sinus exposed its entire length. The bone was eburnated. The walls of the sinus were gangrenous and, when opened, it was filled with a broken-down clot. As no return flow could be established from below, the jugular was exposed, ligated, and removed. The patient died twenty-six hours after the operation as a result of the intense sepsis. No autopsy. J. B. CLEMENS.

66. After performing the usual steps of the radical post-aural operation, a dark spot in the posterior antral wall led to the lateral sinus, which was occupied by a dark red, firm, healthy-looking clot, except at the point of infection, where it was yellow and breaking down. As the operation was performed within twenty-four hours of the first sign, and the clot appeared healthy on each side of the point of infection, the sinus was laid freely open and all clot cleared out from above and below without ligaturing the internal jugular. As giddiness, due in all probability to disturbance of the intracranial circulation, was a marked symptom, the cerebellum on each side of the sinus was explored with a negative result. Double optic neuritis was present, and existed for at least three months after recovery had occurred.

ARTHUR CHEATLE.

67. A man aged thirty-five years suffered with discharge from the left ear for many years. On opening the sinus, it was found filled completely with a soft adherent clot. On passing a small Volkmann's spoon down towards the jugular fossa, a drachm of most offensive pus was evacuated. The sinus having been thoroughly cleaned was lightly packed with gauze. The pus

yielded, on cultivation, growths of staphylococcus pyogenes albus and citreus, a non-capsulated diplococcus, and many putrefactive bacteria. The patient was shown at a meeting of the Birmingham and Midland Counties Branch of the British Medical Association held on Feb. 8, 1900. ARTHUR CHEATLE.

68. The case reported is that of a girl nineteen years of age who had pain in both ears and over both mastoids. The left drum-membrane, which was red and bulging, was incised, and under hot irrigations and the use of the ice coil the severity of the inflammation subsided. The right ear was discharging freely. The ice coil simply relieved the pain in the right mastoid but did not check the extension of the inflammation. After a well-defined chill, followed by a temperature of 104.8° F. and the development of tenderness along the sterno-mastoid muscle, the mastoid was opened. The sinus was superficial and located very far forward; it was exposed, aspirated, and found to contain pus. The internal jugular was then ligated about an inch above the clavicle and opened, being thereupon followed by an outflow of pus. The vein was not excised. Periphlebitis subsequently followed. Patient recovered. The case illustrates the rapidity with which extensive complications can follow acute middle-ear inflammation, the anomalous position of the sinus, and the occurrence of periphlebitis. J. B. CLEMENS.

NERVOUS APPARATUS.

69. BAGINSKY. The pathogenesis of acute deafness. *Arch. f. Kinderheilk.*, Nos. 1 and 2, 1900.

70. COURTADE. Hysterical deafmutism in a girl of three and a half years. *Arch. internat. de laryng., d'otologie*, etc., vol. xii., No. 6, 1899.

71. OPPENHEIM, S. The so-called Ménière's disease. (Vertigo ab aure læsa, vertigo auralis.) *Wien. klin. Rundschau*, Nos. 40 and 42, 1899.

72. CASTEX. On deafness of central origin. *Bulletin de laryng., d'otologie*, etc., March 30, 1900.

73. WEBER, H. PARKES, and LAKE, R. Acute Ménière's symptoms in spleno-medullary leucocythæmia, with special reference to the anatomical changes found in acute leucocythæmic affections of the ear. *Proceedings of the Royal Medical and Chirurgical Society*, Feb. 27, 1900.

74. HOOPLE, H. N. History and discussion of a case with Ménière's syndrome. *Laryngoscope*, Dec., 1899.

69. Connective-tissue and bone formations were found in the cochlea of a girl, thirteen years old, who had been ill with meningeal symptoms and become deaf; she had died three months later from a carbuncle of the upper lip. The temporal bones were examined in serial sections and in addition to a condensing otitis, degeneration of the eighth nerve was found and the tympanum showed no marked changes. Examination of the brain and meninges was negative. Thus an acute labyrinthitis may cause symptoms like meningitis in children. BRÜHL.

70. An intelligent girl, three and a half years old, became deaf and dumb after a slight injury to the hand and fright. No medication has succeeded in relieving the condition. The drum-membranes were practically normal. SCHWENDT.

72. CASTEX believes that central deafness is not sufficiently kept in mind in the cases of deafness of obscure origin. The anatomical connection of the ear and brain is described. Deafness is divided in two groups: central deafness without lesions, and central deafness with lesions demonstrable anatomically. In the latter group belong word-deafness and deafness after meningitis, meningeal and cerebral hemorrhage. A new case of word-deafness, observed in 1897 by Déjérine and Sérieux, is described. At autopsy a chronic cortical periencephalitis extending to both hearing centres. Deafness after meningitis is not rare. Gradenigo was able to get a history of preceding meningitis in 154 out of 2247 cases of nervous deafness. Colley of Lyons observed a similar case of left-sided deafness, combined with hemianæsthesia and hemianopsia. The autopsy revealed an area of softening in the internal capsule and lenticular nucleus.

Deafness without lesions includes, 1. Psychic deafness, frequently met with in neurotics and children. The patient sometimes does not perceive the spoken word, but the sound of a musical instrument. 2. Deafness of inhibitory nature, after fright or emotion. 3. Deafness as epileptic aura; Férè has recently reported a case of this kind.

The diagnosis, deafness of central origin, is to be made when other functions are simultaneously affected, though confounding with hysterical symptoms must be guarded against.

73. A man aged thirty-one years died of spleno-medullary leucocythæmia. About six months before death he was attacked

with headache, vertigo, and vomiting, and became deaf in a very short time. Post-mortem examination of the ears showed that a portion of the scala tympani (one side only examined) and the perilymphatic spaces of the semicircular canals (both sides examined) were filled with newly formed fibroid and bony tissue. The scala vestibuli, canalis cochleæ, and vestibule showed only comparatively slight changes. Transverse sections of the nerve trunks showed no obvious change. The deduced sequence of events is that more or less extravasations of blood in the semicircular canals and cochlea first occur, followed by vascularization and organization of the clot, and, if the patient lives long enough, more or less ossification in the newly formed tissue and the projection of irregular processes of bone from the walls of the bony labyrinth.

WEBER draws attention to the light thrown by leucocythæmic cases of Ménière's symptom-complex on cases associated with constitutional disorders, such as arterio-sclerosis, syphilis, chronic gout, renal fibrosis, and the various cachectic conditions in which hemorrhages often occur. ARTHUR CHEATLE.

74. The patient, a man of decidedly nervous temperament, aged twenty-six, was awakened from sleep by a feeling so strange that he arose, and in doing so, fell heavily to the floor. Two weeks later a similar attack occurred, followed by vomiting and purging. Lighter attacks after this at various times were preceded by vertigo. No loss of consciousness or evidence of epilepsy was present. The vertigo was occasionally apoplectiform. Tinnitus aurium, although absent at first, became annoying and louder after each succeeding attack. The examination of the ear showed no pathological condition to aid in explaining the seizures. HOOPLE thinks the vertigo is due to increased intralabyrinthine pressure, and compares the condition to that caused by glaucoma on the rods and cones of the retina. The theory of a reflex-neurosis is advanced to explain the vertigo, and a number of reasons are given to support it. J. B. CLEMENS.

NOSE AND NASO-PHARYNX.

a.—GENERAL PATHOLOGY.

75. VIOLETT. Means of defence of the organism against respiratory infection in the nasal fossæ. *Arch. internat. de laryng., d'otologie*, vol. xiii., No. 1.

75. VIOLETT has examined under the guidance of Chatellier

the antibacterial action of the nasal mucus. Leucocytes in the nasal mucus possess amœboid action and can swallow pneumococci and diphtheria bacilli and thus render them inert. These leucocytes are only in the mucus of the upper and posterior part of the nasal cavities; this region is also aseptic but the vestibulum is very septic.

Nasal mucus therefore serves partly as a filter for the inflammatory agents. The mucous membrane becomes hypertrophied from the continued irritative action of these agents, though it cannot withstand prolonged irritation and resist invasion of the general organism. Some patients succumb to a slight operative intervention. It is needless to add that in nasal surgery strictest antiseptic precautions must be employed. SCHWENDT.

b.—METHODS OF EXAMINATION AND TREATMENT.

76. KAY. A new nasal speculum for children. *Wratsch*, No. 6, 1900.

77. SALESSOWA. Vibratory massage in the treatment of the diseases of the nose, throat, and ear. *Bolnitschuaja Gaseta Botkina*, No. 37–40, 1899.

78. STERN. Pathology and therapy of chronic rhinitis; treatment with massage. *Eschenedelink*, No. 13, 1900.

79. GRIFFIN, THOMAS. The treatment for hypertrophy of the inferior turbinated bone. *N. Y. Med. Journ.*, Feb. 24, 1900.

80. CHAPPELL, WALTER T. Remarks on intranasal operations. *N. Y. Med. Journ.*, Jan. 17, 1900.

77. Solutions of cocaine 10%, iodine ½%, menthol in vaseline 2%, and parachlorphenol in glycerine 2% were used in the massage treatment. Ozæna and chronic atrophic rhinitis are most benefited of nasal disease by vibratory massage. In the former, massage must be applied daily; the odor disappears, the dry, gray mucous membrane becomes more moist and pink in color, the crusts become softer and are more easily removed. In chronic hypertrophic rhinitis, vibratory massage produces a distinct improvement after five to ten sittings: the mucous membrane becomes paler, the meatuses more free, the hypertrophy and secretion less. If treatment is short, relapses are likely to occur. Vibratory massage influences favorably the neuralgias, eye diseases, hay-fever, and bronchial asthma depending on a nasal affection. Chronic atrophic and hypertrophic pharyngitis are

likewise benefited. In ear disease the ostium and walls of the tube were massaged. It is also well to apply massage externally on the neck. SACHER.

78. STERN describes three cases where massage of the nasal mucous membrane after Hagedorn (*Aertzliche Praxis*, 1899, No. 7) with a hard-rubber catheter and occasional vibratory massage produced rapid diminution of the hypertrophy and secretion. SACHER.

79. GRIFFIN advises the removal of hypertrophy of the soft parts of the lower turbinate as well as that of the bone when the body lies close to the septum. The restoration of the inferior meatus is essential to the prevention of relapses, even of recurrence of polypi. The operation is performed by means of the saw after thorough cocainization and application of suprarenal capsule. For subsequent plugging he uses absorbent cotton only, which is left for twenty-four hours or longer. M. TOEPLITZ.

80. CHAPPELL pleads for conservatism in intranasal operations, particularly those upon the septum. After thorough removal of spurs under cocaine and suprarenal extract the wound is powdered. A splint of guttapercha, shaped before operation, is held firmly over the cut surface by a retainer, and the dressings, in preference those made from Bernays sponge, are introduced external to the splint and left in most cases until the third day. For septal deviations Chappell uses splints consisting of two hollow plates which are connected by a spring and carry a plate at the posterior end after the shape of a fan, to be elevated after introduction. The Simpson splint made from Bernays sponge is used for pressure. M. TOEPLITZ.

c.—OZÆNA.

81. SIEBENMANN. On ozæna (rhinitis atrophica simplex et fœtida). *Correspondenz-Blatt f. Schweiz. Aerzte*, XXX., March 1.

82. NÖBEL and LÖHNBERG. Etiology and operative radical cure of genuine ozæna. *Berl. klin. Wochenschr.*, Nos. 11, 12, 1900.

81. Ozæna is treated by SIEBENMANN chiefly from a pathological standpoint. The two chief peculiarities are the metaplasia of the epithelium and the atrophy of the turbinate. There are, however, cases of metaplasia of the epithelium without atrophy of the turbinates. This metaplasia is the most constant pathological change of this disease, and it might be better to call the atrophic fœtid rhinitis simply metaplasia.

The most important conclusion arrived at is: metaplasia of the epithelium occurs in broad and narrow noses, in broad and narrow faces, but that form of disease of the nasal epithelium combined with the formation of fœtid crusts occurs, as a rule, in the broad nose of the broad-faced persons.

In the discussion following this paper Prof. Müller mentioned that he had observed metaplasia of epithelium of the bronchial mucous membrane. SCHWENDT.

82. In this paper NÖBEL and LÖHNBERG support Grünwald's focal lesion of ozæna. The material includes 111 cases of nasal suppuration, leaving out the suppurations produced by subacute rhinitis, vegetations, syphilis, abscess of septum, foreign body, etc. The number presenting the triad, fœtor, atrophy, crusts, is not stated, nor the number treated by operation. The authors regard the ozæna question as solved, as all attempts at explanation by the turbinate theory have failed and the focal theory has explained all sides of the question and has shown us:

1. That most nasal suppurations appearing like ozæna depend upon disease of the sphenoidal cavity and ethmoidal region.

2. Nasal suppurations with fœtor, atrophy, and crust-formation may depend on various causes; the majority depend on localized suppurations in the sphenoidal and ethmoidal regions.

3. A rational treatment of ozæna can only be expected when the primary cause is discovered.

4. As the causes are usually sphenoidal or ethmoidal empyema, treatment of ozæna must be surgical to be effectual.

The operative treatment of the sphenoidal cavity is given with a description of some new instruments. The number of case histories is unfortunately very small; only three are reported.

MÜLLER.

d.—NEW GROWTHS.

83. HEYMANN. The benign tumors of the nose. Reprint from the *Handbuch der Laryngologie und Rhinologie*, Vienna, 1899.

84. CHOLEWA. Why do nasal polypi recur? *Monatschr. f. Ohrenhlk.*, No. 3, 1900.

83. HEYMANN gives a very detailed description of the benign tumors of the nose with many macroscopic and microscopic pictures. HARTMANN.

84. Polypi result of a subacute osteomyelitis which gives rise to recurrences. KILLIAN.

e.—ACCESSORY CAVITIES.

85. GERBER. A double diaphanoscope for transillumination of the frontal sinuses. *Deutsche med. Wochenschr.*, No. 11, 1900.

86. MARTIN. The frequency of empyema of the nasal accessory sinuses. Paris, A. Masson, 1900.

87. LICHTWITZ. Disproportion between the frequency of the empyema of the accessory sinuses in the living and dead. *Ann. des mal. de l'or.*, etc., No. 11, 1900.

88. FURET. A new case of frontal empyema discharging into the maxillary sinus. *Arch. internat. de laryng., d'otol.*, etc., No. 11, 1900.

89. DE ROALDÈS, A. W. Chronic empyema of the antrum of Highmore operated by the Caldwell-Luc method. *N. Y. Med. Jour.*, Jan. 6, 1900.

90. BRYAN, J. H. Chronic abscess of the frontal, ethmoidal, and sphenoidal sinuses, followed by meningitis and death. *N. Y. Med. Jour.*, Jan. 20, 1900.

91. TILLEY, HERBERT. Two cases of chronic frontal sinus empyema in which the radical external operation had been performed. *Lancet*, Feb. 10, 1900.

85. GERBER has had two transillumination lamps attached to a rod so that both frontal sinuses can be illuminated at the same time. This facilitates the comparison between the two sides. The apparatus can also be used for one-sided illumination, and is made by Reiniger, Gebbert, and Schall. NOLTENIUS.

86. MARTIN has collected all investigations on frequency of empyema on the cadaver and living. The empyema was observed fifteen times more frequently in the dead than the living. The cause for this is the great rarity of occasion for diagnosing empyema. The acute form is hidden by the acute coryza, and in the severe forms masked by the other symptoms. In the chronic form the symptoms are sometimes so slight as not to inconvenience the patient. The difficulty of diagnosis must also be considered. HARTMANN.

87. A paper of more or less the same contents as the preceding. HARTMANN.

88. Transillumination of the maxillary sinus is often negative though pus appears in middle meatus. In a case of this kind FURET opened the antrum according to Luc, but found it normal.

The frontal sinus was opened and found filled with granulations. Recovery took place with a deforming scar. SCHWENDT.

89. DE ROALDÈS reports five cases operated by him according to Caldwell-Luc, as follows: After incision through the soft parts under the everted lip, inclusive of the periosteum, beginning below the gingivo-labial fold near the frenum and extending in a horizontal direction to the root of the first molar, both flaps were detached from the bone, the anterior wall laid bare and opened with chisel and bone forceps. The anterior third of the corresponding inferior turbinated body was then removed with cutting forceps and the nose plugged. From the antrum the nasal wall of this denuded portion was perforated and enlarged with a gouge. The outer opening was closed with catgut sutures and a plug inserted from the nose. M. TOEPLITZ.

90. A female, æt. forty, had left side of nose blocked with polypi, containing also a considerable amount of pus anteriorly and a scant one post-nasally. Through an operation from without, the left frontal sinus and anterior ethmoidal cells were thoroughly cleansed. However, upon investigation, pus continued to ooze. Outer wound was closed after packing the cavity. Death ensued four days later. The autopsy revealed the left side of the cribriform plate to have been destroyed, the left olfactory ganglion softened, the dura mater adherent to the calvaria, a firm clot in the superior longitudinal sinus, and both Gasserian ganglia softened. There was pus in the left posterior ethmoidal and in both sphenoidal sinuses, which had not been recognized during life. An acute lepto-meningitis was also found. M. TOEPLITZ.

91. In both cases the disease was bilateral and the antra also affected. TILLEY'S usual line of treatment is to remove the nasal polypi or chronic inflammatory products from the region of the middle meatus, and also in all cases the anterior half of the middle turbinate bone before opening the sinus by the brow incision; the antra, if affected, being drained by the alveolar route. A drainage tube is inserted in cases where the sinus had not been obliterated. The results in the cases shown at a meeting of the Harveian Society of London, February 1st, were very satisfactory. ARTHUR CHEATLE.

f.—OTHER AFFECTIONS OF THE NOSE.

92. KAYSER. Adhesions in the nose (synechia and atresia). Reprint from *Handbuch der Laryngologie und Rhinologie.*

93. FLATAU. The radical operation of bony occlusion of the choanæ. *Wien. klin. Rundschau*, No. 40, 1899.

94. WOAKES, CLAUD. Bullet wound in the head; removal of the bullet from the nose months afterward. *Lancet*, Jan. 6, 1900.

95. EDDOWES, A. Coccogenous sycosis, which had commenced on the upper lip, apparently from infection due to discharge from the nose. *Lancet*, Feb., 1900. Harveian Society, Feb. 1, 1900.

95*a*. COBB, FRED C. Epistaxis. *Boston Med. and Surg. Journ.*, Jan. 4, 1900.

92. There are anterior, middle, and posterior synechiæ. The last are very fully described. Of congenital atresia of the choanæ three groups are formed, according to position and genesis: 1, intranasal atresia of the choana; 2, marginal atresia of the choana; 3, extranasal or retronasal atresia of the choana, which are situated just back of the choanæ. HARTMANN.

93. A patient, forty years old, had the right nasal cavity filled with greenish-yellow masses of mucus, and the lower turbinate appeared hypertrophied and touched the septum.

By posterior rhinoscopy a complete closure of the oval aperture was revealed by a pale-red homogeneous plate of bony consistency. The lower turbinate was resected and two weeks later the central part of the plate was cut away; the finger introduced in the pharynx protected the parts there from injury. Recovery, with relief of symptoms. POLLAK.

94. A soldier was shot from above, the bullet entering the skull just below the left frontal eminence and destroying the eye. Twenty months later a broad membranous bridge almost closed the left nostril. After cutting through the membrane, an irregular piece of lead measuring 1 inch in length, $\frac{5}{8}$ of an inch in breadth, and weighing 343 grains, was removed, together with a square inch of khaki, which had been carried in from the peak of the helmet. The inner wall of the antrum and the anterior two-thirds of the inferior turbinated bone were absent. A small stellate scar was present in the roof of the mouth.

ARTHUR CHEATLE.

95. The patient had had sore eyes for many years, and EDDOWES thinks that they had infected the nose and thence the lip. Treatment of the eyes with yellow oxide of mercury was advised. ARTHUR CHEATLE.

95*a*. The causes of epistaxis are local or general. The commonest local cause is the deformity of the septum anteriorly, with

the forcible removal of crusts with the finger or handkerchief, or sometimes posteriorly. Ulcerations may also occur without scratching. Other local causes are fracture, angioma, and operations. Among the general causes are plethora, anæmia, hemorrhagic diathesis, acute febrile diseases, vicarious menstruation, syphilis, phthisis, alcohol, and nephritis, the latter being illustrated by two cases. For treatment, cocaine, suprarenal extract (10 %), cauterization with chromic acid and galvanocautery, and packing with long strips of gauze are recommended.

M. TOEPLITZ.

g.—NASO-PHARYNX.

96. LICHTWITZ and SABRAZES. State of the blood in those with adenoids. *Arch. intern. de laryng., d'otol.*, etc., vol. xii., No. 6.

97. DANZIGER. Adenoid vegetations. *Monatschr. f. Ohrenheilk.*, No. 1, 1900.

98. TETEREWJATNIKOW. On the frequency of adenoids, their connection with ear disease and aprosexia. *Medicinskoje Obosvenje*, February, 1900.

99. ARSLAN. On 1800 cases of adenoid vegetations. *Archiv italiano di Otologia*, etc., vol. ix., 159.

100. GARBINI. Hypertrophy of the pharyngeal tonsil in the province of Messina and Reggio. *Arch. ital. di Otol.*, vol. ix., p. 204.

101. HELLAT. Carcinoma of the naso-pharynx. *Eshenedelnik*, No. 14, 1900.

96. These authors found the blood of children suffering with adenoids to contain fewer blood corpuscles and hæmoglobin than normally. After the removal of the adenoids the condition of the blood improved to the normal. SCHWENDT.

97. DANZIGER endeavors to arrange children with adenoids in groups. The basis of this division is, however, very uncertain.

KILLIAN.

98. In the last three years 7270 throat, nose, and ear patients visited the clinic Basanow, in Moscow. Of this number 8 % were afflicted with adenoids. One third of these suffered also from ear disease. In three cases adenoids were found in patients between forty and fifty years. Of 200 students with ear trouble, 20 % suffered from adenoids. SACHER.

99. This is an exact statistical report of the conditions associated with adenoid vegetations. GRADENIGO.

100. In the moist climate of southern Italy, with inconstant temperature, GARBINI found 5% of his patients to have adenoids, 20% in the patients under twenty years.

GRADENIGO.

101. Carcinoma of the naso-pharynx is very rare, and only three cases have been described. HELLAT describes the following case: A woman forty-three years old had been ill with severe coryza and deafness for several months. A compact nodular and easily bleeding tumor occupied the posterior and lateral walls of the naso-pharynx. Microscopically the tumor proved to be a carcinoma. The growth was removed with a sharp spoon, and adenotome, but recurred in Rosenmüller's fossa after several weeks. Extension into the skull caused hemiparalysis of the face, headache, paralysis of the vocal cords, increase in pulse rate to 126, dysphagia, dyspnœa, fever, anæsthesia and hypersecretion of the pharynx, paralysis of the ocular muscles, and finally death from paralysis of the heart. Every attempt at speaking caused marked dyspnœa; this, Herzfeld thinks, is due to a paralysis of the recurrent nerves. The difficulty in swallowing and in expectoration was caused by paralysis of the superior laryngeal nerves. Prof. Ratimow had observed a similar cause originating in the posterior wall. One month later, blindness of central origin set in. The glands were enlarged. Paralysis of the cranial nerves and death followed. SACHER.

SOFT PALATE, PHARYNX, AND BUCCAL CAVITY.

102. AVELLIS. Pemphigus of the mucous membrane as a cause for adhesion of the soft palate, and cure by particular hard-rubber bougies. *Münch. med. Wochenschr.*, No. 10, 1900.

103. KUJASHEZKI. On the tonsils of children. Dissertation, St. Petersburg, 1899.

104. ROEGER. Angina with endocarditis. *Münch. med. Wochenschr.*, No. 8, 1900.

105. AUE. The tonsils, as entrance for infection in the organism. *Bolnitschuaja Gaseta Botkina*, Nos. 2 and 3, 1900.

106. RATIMOW. Lymphangioma of the soft palate. *Eshenedelnik*, No. 14, 1900.

107. KELLER. Syphilis of the lingual tonsil. *Berl. klin. Wochenschr.*, No. 9, 1900.

108. POLJAKOW. A case of healed noma. *Medicinskoje Obosvenje*, August, 1899.

109. KIESOW. Contribution to the psycho-physiology of the buccal cavity. *Arch. ital. di Otologia*, vol. ix., p. 129.

110. HOPE, G. B. Primary hemorrhage following amygdalotomy. *N. Y. Med. Jour.*, March 3, 1900.

111. HOWE, ALEXANDER C. Gangrene of the tonsils. *Phil. Med. Jour.*, March 17, 1900.

112. PACKARD, FREDERICK C. Endocarditis occurring in the course of tonsillitis. *Amer. Jour. Med. Sci.*, Jan., 1900.

113. GAMBLE, CARY B. and TIFFANY, L. M. Foreign body imbedded in the naso-pharynx and posterior pharyngeal wall. *Phil. Med. Jour.*, Jan. 6, 1900.

102. AVELLIS's is the fourth case of pemphigus causing this deformity. Hegar's hard-rubber bougies were used, similar to those used for the cervix. SCHEIBE.

103. Numerous measurements on bodies of children showed that the tonsils increase in weight three and a half times to end of first year, three and a half times between first and fifth years, and, again three and a half times between fifth and twentieth years. The pharyngeal tonsil becomes 4 *mm* longer and 3 *mm* broader and thicker in the first year, and 5 *mm* longer, 3 *mm* broader, and 2 *mm* thicker between the fifth and twentieth years. The tonsils develop by diminution of the connective tissue and the increase of the lymphoid elements. Their function, the emigration of lymphocytes through the epithelial covering, can be observed in the new-born, but is less in sucklings. SACHER.

104. In 120 cases of angina, a cardiac murmur was noted in 20 per cent. SCHEIBE.

105. AUE relates a case of a girl, eleven years old, where endocarditis, articular rheumatism, and erythema nodosum followed a simple angina. Staphylococcus pyogenes aureus was obtained from both tonsils. SACHER.

106. Two cases of lymphangioma of the soft palate have thus far been reported. The following is the third : A patient, forty-one years old, had had a small tumor removed from the soft palate fourteen years ago on account of difficulty in breathing and swallowing. The tumor recurred four years ago in the right half of the soft palate. Above the angle of the right jaw there is a round swelling as large as a hen's egg. The right half of the

soft palate is occupied by a round nodular tumor, as large as an orange, filling the naso-pharynx and a part of the pharynx; it was circumscribed and fluctuated in places. The slow growth and defined margin favor benignity. The tumor was easily removed after resection of the lower jaw. All symptoms were relieved. The microscopical specimen showed the development of lymph spaces and cysts from the fat situated between the muscles of the soft palate. SACHER.

107. KELLER proves that secondary syphilis does not infrequently, in 10–12 per cent., produce typical and severe processes in the lingual tonsil. The relation of the smooth atrophy of the lingual tonsil to syphilis is thus made clear. Among 6500 reports of autopsies, of 103 cases of atrophy of the root of the tongue, 71 showed anatomical signs of syphilis. In his own researches 17.5 per cent. of marked atrophy in 40 cases of tertiary syphilis have led the author to regard the smooth atrophy of the root of the tongue as a symptom of value when in conjunction with others. MÜLLER.

108. The healing took place by the application of 1 per cent. solution of pyoctaninum cœruleum. This solution was applied several times daily. The gangrenous parts were cast off after a few days and the base of the ulcer cleansed itself. SACHER.

109. KIESOW demonstrated that a part of mucous membrane of the cheek was totally insensitive to pain. This region lies in the line drawn from the angle of the mouth back to the second molar. GRADENIGO.

110. HOPE ablated both tonsils under chloroform in a woman æt. twenty-six. The bleeding following the operation continued for three hours and was controlled by the galvano-cautery, ergot, the maintenance of the erect position, and principally by the final syncope. M. TOEPLITZ.

111. A male, æt. twenty-six, emitted a strong odor from the mouth owing to a brownish, foul-smelling discharge. The lower part of face and left submaxillary region were considerably swollen. The gums, inner surface of the lips, and under surface of the tongue were greatly swollen and covered with deep excoriations or ulcers. On the left side there was a large tumor, involving the entire tonsillar region, extending beyond the median line to a point near the opposite tonsil and well up into the naso-pharynx, with a circular necrosed spot half an inch in diameter,

of greenish color, perforated in its centre and in the same manner on the inner surface. In spite of several removals of the gangrenous masses, the destruction extended farther until nitric acid was applied. Three months after recovery severe epistaxis set in which could not be controlled except by constant plugging. In a few days the nose issued a foul-smelling discharge, multiple abscesses appeared, and the patient died from septic pyæmia.

M. TOEPLITZ.

112. PACKARD reports in full five cases in which an acute tonsillitis of more or less severe character was followed by a central valvulitis, arising as a direct consequence either from infection by micro-organisms or structural change in the valves due to toxines. The paper concludes by many literary references.

M. TOEPLITZ.

113. A woodcarver, æt. thirty-nine, was working at a machine consisting of a frame in which two chisels ($4\frac{1}{2}'' \times 1'' \times \frac{3}{16}''$, and $3\frac{1}{2}$ ounces in weight) were fastened. The frame was revolving 3200 times a minute, when it broke, setting the chisels free, which struck the workingman, whose throat, across larynx and trachea, was cut, and also the face from the inner side of the right ear upwards to the bridge of the nose, which was fractured. His head was then bent slightly forward and to the right, and the vision in the right eye was gone. He had difficulty in swallowing, food regurgitation through the nose, and a muffled voice. A hard mass was felt with the probe through the right lower nasal meatus and with the finger behind the soft palate, extending far upward, straight up and down, with its width antero-posterior, and firmly fixed. A skiagraph defined the upper end about an inch above the nasal floor, resting against the right palate bone, with its lower end against the fifth cervical vertebra. The chisel was removed through a facial incision after preliminary tracheotomy.

M. TOEPLITZ.

BOOK NOTICES.

VIII. **A Manual of Otology.** By GORHAM BACON, A.B., M.D., Professor of Otology, Cornell University Medical College, New York; Aural Surgeon New York Eye and Ear Infirmary. With an introductory chapter by Cl. J. Blake, Professor of Otology, Harvard University. Second edition, revised and enlarged. With 114 illustrations and 3 plates. Small 8vo, 422 pages. Lea Bros. & Co., New York and Philadelphia, 1900. Price $2.25.

This second edition of Dr. Bacon's text-book, not quite two years after the appearance of the first, is sufficient evidence of its value and appreciation. It has been increased by about twenty-five pages, a number of new figures, and replacement of old ones by new. Among the latter is Plate II., colored, with six figures representing different otoscopic pictures of the drum membrane. They give an idea of conditions they are meant to represent, but suffer from the imperfection inherent in almost all pictures of the drumhead. There are things we can learn only by studying them from nature. Clinical observation can be assisted, but not replaced by drawings. As a college text-book Bacon's manual is excellent. H. K.

IX. **Eye, Ear, Nose, and Throat.** A manual for students and practitioners. By W. L. BALLENGER, M.D., and A. G. WIPPERN, M.D., of Chicago, Ill. Lea Bros. & Co., Philadelphia, Pa. Price, cloth, $2.00; flexible leather, $2.50.

This is a very well gotten-up text-book of 511 pages, small 8vo, with 150 engravings and 6 colored plates; heavy glazed paper; one of "Lea's Series of Pocket Text-Books." The Eye, occupying 170 pages, is by Wippern; the Ear (97 pp.), the Nose (80 pp.), the Pharynx (69 pp.), and the Larynx (66 pp.) by Ballenger.

Type and illustrations are clean, the latter almost all borrowed from other books, and the bulk of the text likewise. The authors

do not conceal this and declare they "have made free reference to nearly all of the recent text-books of English and American authorship, as well as to a number of French and German works." Nevertheless they have done a good work, furnishing to the rapidly increasing army of American young physicians that want to make the above specialties their life-work a concise, clear, and handy guide-book admirably adapted to their needs and desires. Several chapters give evidence that the authors have been more than diligent and capable compilers, as is evidenced by some chapters bearing the stamp of personal experience and judgment; for instance, the paragraphs on the Pharynx, where we even find several illustrations without the names of the original authors, and some instruments without the imprint of the firms making them. The condensation of the subject-matter is very practical, and the presentation neither meagre memory-drudgery, nor tedious schoolmaster talk on more or less generally known topics. The easy style shows that the authors have been instructors of those to whom the compendium chiefly seems to appeal — the students of post-graduate and polyclinical institutions. H. K.

SOCIETY MEETING.

The Third Pan-American Medical Congress will be held in Havana, Cuba, December 26th to 29th, inclusive, 1900. There will be a Section of Otology of which Dr. Jas. F. McKernon, 62 West 52d Street, New York, is the Secretary for the United States, and a Section of Ophthalmology, of which Dr. J. E. Weeks, 46 East 57th Street, New York, is the Secretary for the United States. The rate of the round trip to Havana will be about one fare. Particulars concerning transportation may be had by addressing Dr. H. L. E. Johnson, 1042 L Street, N. W., Washington, D. C.

Obituary.

Professor KUHN, of Strassburg, is dead.

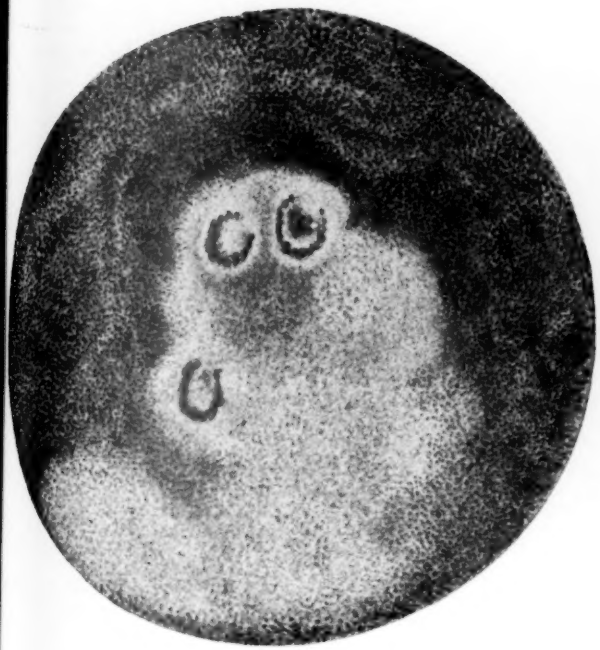

Fig. 1.

Fig. 2.

Fig. 3.

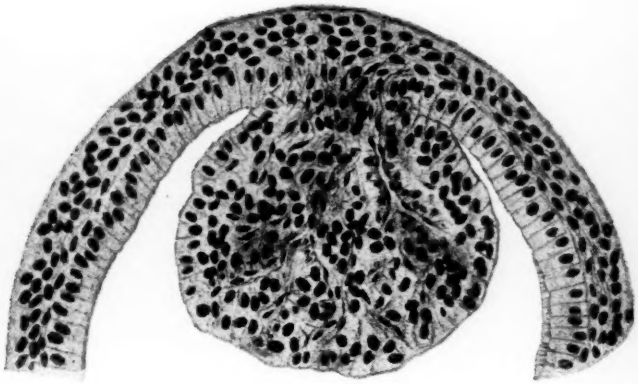

Fig. 4.

VERLAG VON J. F. BERGMANN, WIESBADEN.